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ON CONTRACT STANDARD CLAUSES: H. Eltinge Breed, J. H. Brillhart, J. S. Langthorn, Edward H. Lee, Hunter McDonald, George H. Pegram, Henry H. Quimby.

ON INDUSTRIAL EDUCATION: Herman Schneider, E. J. Mehren, Leonard S. Smith.

ON ELECTRIFICATION OF STEAM RAILWAYS: Charles F. Loweth, B. J. Arnold, George Gibbs, George W. Kittredge, E. J. Pearson, Samuel Rea, Robert Ridgway.

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INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

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ITEMS OF INTEREST

The Committee on Technical Activities and Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

Report of the Special Committee on Specifications for Bridge Design and Construction

The Final Report of the Special Committee on Specifications for Bridge Design and Construction on Specifications for Design and Construction of Steel Railway Bridge Superstructure will be presented to the Annual Meeting of the Society on January 17th, 1923.

This report which appears in this number of *Proceedings*, under Papers and Discussions, contains, in addition to the Specifications, working tables and diagrams for use in connection with them.

Progress Report of the Special Committee on Stresses in Railroad Track

The Third Progress Report of the Special Committee on Stresses in Railroad Track has been received, and will be presented to the Annual Meeting of the Society on January 17th, 1923.

This Special Committee which was organized in 1914, has been co-operating with the Committee of the American Railway Engineering Association, the membership of the two Committees being the same, with one exception.

The Progress Report gives the results of tests on straight track and on curved track on four railroads, eight different types of locomotives having been used in the tests.

Portland Section Plans Award of Prizes to Members of Student Chapter of Oregon Agricultural College

At the meeting of the Portland Section on February 17th, 1922, a Committee was appointed to make rules for prizes to be awarded by the Section to members of the Student Chapter at the Oregon Agricultural College for merit in papers presented before the Section.

No prizes were awarded for 1922, but the program will be carried out in 1923.

The following are the rules governing the awarding of prizes by the Section, as amended and adopted:

"*1st.*—Three prizes, a first of $25, a second of $15, and a third of $10, shall annually be offered by the Section to be competed for by the students of the Senior Class taking the course in Civil Engineering at the Oregon Agricultural College, open to all regularly matriculated students in good standing.

"*2d.*—Every paper in competition shall be in typewritten form, and shall contain not to exceed 5 000 words.

"*3d.*—There shall be no limitation as to subject-matter, except that the paper shall discuss a problem which has come under research or the personal observation of the competitor.

"*4th.*—Every paper in competition shall be submitted for inspection of the Board of Directors of the Section, not later than May 15th in the year for which prizes are to be awarded, and shall be unmarked as to the name of the author who, however, for identification, shall place some private mark upon the first sheet of the paper, enclosing in a sealed envelope attached and similarly marked his full name.

"*5th.*—Attached to each paper shall be a certificate of the Professor of Civil Engineering of the College that, except for his advice and suggestion, the work is the competitor's own.

"*6th.*—Successful competitors shall, within the calendar year, appear in person before the Section to deliver the papers and to receive their awards.

"*7th.*—The prizes shall be invested in standard technical works of permanent character which may be desired by the competitor, suitably inscribed by the President of the Section."

New Information Service

The National Research Council has established a general clearing house for scientific and technological information as one of its major departments. Civil

engineers will be interested in this new service bureau as a supplement to the Engineering Societies Library, its associated information service, and the resources of the Society, as the clearing house at Washington, D. C., covers the entire range of Natural Sciences and their technological applications.

If the Research Information Service cannot comply with a request, it almost certainly can tell where to find the information needed. Members of its Technical Staff are constantly answering inquiries about research problems, methods, apparatus, processes, reports, and their relations to industrial needs.

Civil engineers are cordially invited by the National Research Council to avail themselves of this additional informational resource. Ordinarily, requests are answered without charge and, in the event of special search, compilation of report, or copying of records, a charge is made to cover the cost. Forward requests to Information Service, National Research Council, Washington, D. C.

Investigation of Arch Dams by Engineering Foundation

Engineering Foundation has started an investigation of arch dams and has appointed the following Advisory Committee: Messrs. F. E. Weymouth, Chief Engineer, U. S. Reclamation Service, Denver, Colo.; H. F. McClure, State Engineer, Sacramento, Calif. (alternate, Paul Bailey, Deputy Chief of Public Works), representing the State of California; M. M. O'Shaughnessy, City Engineer, San Francisco, Calif. (alternate, R. P. McIntosh, Designing Engineer), representing the City of San Francisco; H. Hobart Porter, Member of Engineering Foundation, New York City (alternate, Wynn Meredith, of Sanderson and Porter, San Francisco); Silas H. Woodard, Member of Engineering Foundation, New York City; Professor C. Derleth, Jr., University of California, Berkeley, Calif.; H. Hawgood, Consulting Engineer, Los Angeles, Calif.; D. C. Henny, Consulting Engineer, Portland, Ore.; and Fred A. Noetzli, Chief Engineer, Bissell and Sinnicks, San Francisco, Secretary, all of whom are members of the Society. A Chairman is to be chosen at a meeting to be held in December, 1922, or January, 1923.

The purposes of the investigation are: First, to collect all possible information regarding the design, construction, history, and behavior of existing arch dams; and, second, to study by observation of existing dams or those to be built in the near future, or of test dams, the movements under changes of load, temperature, and other conditions. From these studies, it is hoped that there may be evolved a more rational and generally acceptable method for the design of arch dams. Among the objects sought is economy combined with that degree of security which is demanded in each case.

Engineering Foundation has appropriated $500 to meet the preliminary expenses of the Committee and will act as treasurer for contributions made to the investigation. Several firms engaged in the design and construction of arch dams and companies owning or contemplating such dams have offered assistance in making observations and have indicated their willingness to contribute to the fund at the appropriate time. Much information about existing structures has already been gathered.

Engineers having information which would be valuable to the Committee or suggestions as to methods of conducting the investigation, should communicate with Mr. Fred A. Noetzli, Secretary, Care, Bissell & Sinnicks, 1100 Santa Fé Building, San Francisco, Calif.

Further information about the project may be obtained by writing to Alfred D. Flinn, Director, Engineering Foundation, 29 West 39th Street, New York City.

Reinforced Concrete Multiple Arches

The observed facts are meager on which to base theory and practice of the design of reinforced concrete multiple arches, especially for structures composed of a number of arches and relatively tall piers. A. C. Janni, M. Am. Soc. C. E., recently proposed to Engineering Foundation that it undertake to organize a co-operative study of such structures, involving tests of experimental arches and piers built for the purpose. The Foundation sought the counsel of the Advisory Committee on Civil Engineering Research which has given the subject careful consideration. The study is believed to be important and desirable, but would involve extensive work and probably large expense. If support for the project should develop and it should be undertaken, a natural beginning would be observations on existing bridges of this type.

Indirectly, Engineering Foundation has heard of stress measurements continued for two years on a large bridge of this kind. Mention has also been made of another bridge on which preparation for observations were made and on which some measurements may have been taken. There may be other cases. Engineers who have knowledge of such data are requested to communicate with Engineering Foundation, 29 West 39th Street, New York City, expressions of opinion as to the usefulness of the proposed investigation, and information about existing bridges on which observations could be made, would also be helpful. Information about deformations and stresses in such structures caused by shrinkage of the concrete, temperature, and moisture changes, settlements of foundations, and effects of removal of concrete forms, is also sought. These factors may be more important than "loads".

Report of Building Code Committee of the U. S. Department of Commerce

The Building Code Committee of the Department of Commerce has submitted a final report on the Recommended Minimum Requirements for Small Dwelling Construction.

The report is substantially the same in scope, subject-matter, and arrangement as the preliminary draft, but many important changes have been made in the recommendations. Thirty full-page illustrations are given, showing good practice in the use of various building materials, the whole report covering about 100 pages. Applications for copies of this report should be addressed to the Superintendent of Documents, Washington, D. C.

Fire Prevention in Highway Bridges

A copy of the report of the Co-operative Committee on Fire Prevention in Highway Bridges has been received by the Secretary and will be placed on file in the Reading Room of the Society. The Committee is composed of Messrs. George W. Booth, M. Am. Soc. C. E., Chief Engineer, National Board of Fire Underwriters, New York City, *Chairman;* L. T. Ericson, Assoc. M. Am. Soc. C. E., Chief Engineer, The Jennison-Wright Company, Toledo, Ohio; C. M. Taylor, Affiliate, Am. Soc. C. E., Past-President, American Wood Preservers' Association, Elizabeth, N. J.; D. F. Holtman, Assoc. M. Am. Soc. C. E., Construction Engineer, National Lumber Manufacturers Association, Washington, D. C.; C. J. Hogue, M. Am. Soc. C. E., Manager, West Coast Forest Products Bureau, New York City; F. E. Schmitt, M. Am. Soc. C. E., Associate Editor, *Engineering News-Record,* New York City; and E. F. Kelley, Assoc. M. Am. Soc. C. E., Senior Highway Bridge Engineer, U. S. Bureau of Public Roads, Washington, D. C., *Secretary.*

Reports of Delegates to International Congress of Engineering

On November 28th, 1922, following a dinner, attended by about 40 guests, at the Engineers' Club to the returned delegates from the International Congress of Engineering held at the Brazilian International Exposition, Calvin W. Rice, Secretary of the American Society of Mechanical Engineers, the delegate from that Society to the Congress, gave an interesting account of his trip. Mr. Rice spoke of the cordial reception he had received, emphasized the need of co-operation between engineers of the Americas, and outlined a plan for furthering the relations promoted by the Congress.

Other speakers of the evening were Mr. George F. Kunz and Fred Lavis, M. Am. Soc. C. E., who was one of the delegates of the Society to the Congress. Mr. Lavis discussed the difficulties at present prevailing in the financing of South American enterprises and suggested co-operation to the end that better laws and financing arrangements might be made.

The report of Verne Le Roy Havens, M. Am. Soc. C. E., who was also a delegate of the Society to the Congress, has been received. Mr. Havens in his address on September 17th, 1922, at the opening session of the Congress, emphasized the point that the solution of many of the ills that beset the world today are problems of engineering and expressed the hope that a permanent relationship might be established between the scientific, technical, and industrial societies of North and South America, in order that common problems might be discussed.

Annual Meeting of the American Society of Mechanical Engineers

The Forty-third Annual Meeting of the American Society of Mechanical Engineers was held December 4th-7th, 1922, in the Engineering Societies Building, New York City. Mr. John L. Harrington, of Kansas City, Mo., was elected President for the ensuing year.

In the number and range of papers presented, it is stated that the meeting established a new high mark in the history of the annual gatherings of the Society. Joint sessions were held with the American Economic Association, the American Society of Safety Engineers, the American Engineering Standards Committee, the American Society of Refrigerating Engineers, and the Stoker Manufacturers Association.

Among other features of the meeting was the initial demonstration of the Chester amphibian gun mount or tank, trips of inspection to the Brooklyn Navy Yard and various industrial plants, etc.

An elaborate social program and meetings of the engineering alumni of various colleges contributed to the factors which made the meeting a distinct success.

Engineers of Ufa, Russia, Appeal for Aid

Under date of October 20th, 1922, C. R. Howard, Assoc. M. Am. Soc. C. E., District Supervisor at Odessa, Russia, of the American Relief Administration, transmitted, at the request of the Engineers of the City of Ufa, Russia, an appeal for aid from American Engineers.

The appeal states that many of the engineers are suffering as a result of malnutrition, bad quality of food, lack of clothes, foot wear, etc.

Mr. Howard states in his letter that he "personally was stationed at Ufa from May to October 1st of this year, and the conditions existing in that part of Russia are beyond description."

Remittances should be addressed to the American Relief Administration, 42 Broadway, New York City.

ACTIVITIES OF LOCAL SECTIONS*

Meeting of the Atlanta Section

A regular meeting of the Atlanta Section was held at the Winecoff Hotel, Atlanta, Ga., on November 13th, 1922; President William C. Spiker in the chair; Frederick H. McDonald, Secretary; and present, also, 53 members and guests. The guests included 25 members of the Student Chapter of the Georgia School of Technology.

As one of a series of lectures on "Developing the Resources of Georgia", Mr. W. H. Hammond, Assistant Chief Engineer of the Georgia Railway and Power Company, presented an interesting and instructive address, illustrating and describing the project and contemplated water power developments of his Company.

The resolution of the Detroit Section requesting an expression of opinion on the subject of the continuance of the Employment Bureau as a Society activity was presented by the Secretary, and on motion, duly seconded, was referred to the members by letter for subsequent action.

C. M. Kennedy, Jr., Chairman of the Student Chapter of the Georgia School of Technology, thanked the members of the Section for their interest and courtesy. He also requested further interest by the local engineers in student activities and invited them to attend and participate in the monthly meetings of the Student Chapter. A similar invitation was extended to the students by President Spiker of the Section.

Annual Meeting of the Detroit Section

The Annual Meeting of the Detroit Section was called to order at the Detroit Yacht Club, on September 29th, 1922; Vice-President E. M. Walker in the chair; Alexander L. Trout, Secretary; and present, also, 36 members.

The minutes of the previous meeting were read and approved.

The Annual Report of the Treasurer was also read and approved, after which Secretary Trout made a brief verbal report of the year's activities.

On motion, duly seconded, a resolution drafted by Mr. Gardner S. Williams was introduced requesting the discontinuance of the support of the National Employment Bureau of the Federated American Engineering Societies. After discussion of the subject, which brought out the feeling that the Bureau benefited only the New York members and that the general problem of employment could be handled more effectively and with less expense by the Local Sections, on motion, duly seconded, the Secretary-elect, Mr. F. H. Stephenson, was instructed to carry out the provisions of this resolution, which was passed unanimously.

On motion, duly seconded, the following resolution was unanimously adopted:

"*Resolved,* That permission be asked of the Board of Directors of the American Society of Civil Engineers to amend the Constitution of the Detroit Section so as to reduce the dues of the Local Section to $1.00 per annum to take immediate effect.

* For List of Local Sections, Officers, etc., see 1922 Year Book, p. 41, and p. 20 of this number of *Proceedings*.

"*Resolved,* That the Board of Directors of the American Society of Civil Engineers be requested to assign all members located in Michigan and in the Canadian cities fronting on the Detroit River to the Detroit Section pending the formation of other Local Sections which may later be organized on petition of members of any special district or area, payment of local dues to be optional until such time as local dues may be abolished.

"*Resolved,* That the Board of Directors of the American Society of Civil Engineers be advised that it is the desire of the Detroit Section that at the earliest possible time the dues of the Local Section be abolished and the Local Section be supported to the extent of $3.00 per annum per member from dues paid to the National Society."

The election of the following officers for the ensuing year was announced: President, C. Y. Dixon; First Vice-President, E. M. Walker; Second Vice-President, L. E. Ayres; and Secretary-Treasurer, F. H. Stephenson.

In anticipation of an inspection trip to be made on September 30th, 1922, Col. Theodore A. Leisen gave an interesting talk on the "Detroit Filtration Plant" which was illustrated by lantern slides.

Inspection Trips at Annual Meeting of Detroit Section

Previous to the Annual Meeting on September 29th, 1922, an inspection trip to the following points was made: Belle Isle Bridge, the New Detroit Yacht Club Building, and the Scott Memorial Fountain. At each place, the construction problems thereof were explained by the Superintendent in charge and more than 40 members took part in the trip.

On September 30th, 1922, about 20 members inspected the Detroit Filtration Plant which had previously been described by Col. Theodore A. Leisen.

Meeting of the Iowa Section

A meeting of the Iowa Section was held at Iowa City, Iowa, on October 18th, 1922; R. W. Crum, Secretary; and present, also, 26 members and 15 guests.

The meeting was devoted to an address by Secretary John H. Dunlap of the Society, who discussed the Fall Meeting of the Society in San Francisco, Calif., the work of the Society, and the duties of the Secretary's office. Director Anson Marston also addressed the meeting briefly.

On motion, duly seconded, Mr. Dunlap's resignation as President of the Section was accepted.

Entertainments at Meeting of Iowa Section

At the time of the meeting of the Section on October 18th, 1922, at Iowa City, Iowa, inspection trips were made to the Hydraulic Research Laboratory and the Children's Hospital of the State University of Iowa.

The members and guests of the Section were also entertained at dinner by the Iowa City Engineers' Club.

Meeting of the Nashville Section

A regular meeting of the Nashville Section was held on November 6th, 1922; President B. H. Klyce in the chair; L. C. Anderson, Secretary; and present, also, about 30 members and guests.

Mr. A. J. Dyer presented an interesting outline of the construction work of the Hetch Hetchy Water Project for the City of San Francisco, Calif., as noted by him during the inspection trip made at the time of the Fall Meeting of the Society, in San Francisco, in October, 1922.

Meeting of the New York Section

A meeting of the New York Section was held at the Engineering Societies Building on November 15th, 1922; President J. Vipond Davies in the chair; Harold M. Lewis, Secretary; and present, also, about 185 members and guests.

President Davies called attention to the fact that membership in the Section is not automatic and that although all the local members of the Society receive notices of the meetings of the Section only those who have joined the Section are contributing to its support.

Referring to a report made to the Board of Directors by the Public Relations Committee of the Section, concerning the proposed War Memorial in Central Park, President Davies read the following resolution, which had received the approval of the Board of Directors:

"*Resolved,* That the New York Section of the American Society of Civil Engineers does not oppose, but is heartily in favor of the erection of a suitable War Memorial under proper design and conditions, but does oppose the location in Central Park of the composition proposed; and be it

"*Resolved,* That the entire project be restudied and subjected to the best obtainable artistic and engineering criticism, to the end that an enduring monument may be erected, which coming generations will have no reason to regret or criticise; and be it further

"*Resolved,* That the Committee on Public Relations be authorized to cooperate with other commercial organizations and societies in the endeavor to prevent encroachments upon Central Park, and to determine upon an appropriate design and a proper location for a worthy War Memorial."

On motion, duly seconded, the resolution was carried unanimously as the expression of the opinion of the meeting.

It was announced that President Davies had appointed the following Committee on Structural Engineering: Messrs. F. E. Schmitt, *Chairman,* William Cullen Morris, and D. L. Turner.

The subject for discussion at the meeting, "Relations Between Engineers and Contractors", was opened by Col. W. G. Atwood, Director of the Committee on Marine Piling Investigations of the National Research Council. In the course of his discussion, Col. Atwood asked for co-operation between engineers and contractors and criticized the proposed form of standard contract as having changed from the extreme of placing the responsibility for all decisions on the engineer to that of leaving everything to arbitration.

Mr. Frederick L. Cranford discussed the subject from the viewpoint of a general contractor, stating that he considered present contracts too complicated in form and thought that they could be simplified to much advantage. He gave the underlying cause of friction between contractors and engineers as the false position in which the engineer is placed by making him responsible to the owner and public and at the same time sole arbiter on all questions between himself as engineer and the contractor. The engineer should have full con-

trol of the conduct of the work, but appeal should be provided on questions of payment.

Rear-Admiral H. H. Rousseau, C. E. C., U. S. N., outlined the differences between Government and private contracts. He reported that a single standard Government contract form is being prepared for all departments, and that standard specifications are also being prepared under the Federal Specifications Board. The false supposition that the Government is legally entitled, under a given specification, to more than a private individual, has been a source of much disagreement.

Mr. John F. O'Rourke described his experiences as an engineer and contractor. He believes that if an engineer enters his work with the intention of being fair, and persuades the contractor that such is his intention, there is not likely to be any friction. The work of the engineer and of the contractor is really very similar, as "one utilizes the forces of Nature for the use and convenience of man, and the other utilizes the forces of man for the use and convenience of man".

Col. Roger D. Black, President of the Roger Black Company, Incorporated, pointed out that the engineer, the contractor, and the owner have a common interest. It has been the custom to make the contractor "hold the sack", and this is not entirely fair, but the contractor's service should be rated for what it is worth, and the engineer and contractor should then work together to keep the cost down to the lowest point.

Mr. Paul G. Brown mentioned some of the cases in which existing forms of contract have caused embarrassment for the contractor, and spoke of the unfairness often resulting from delay in getting the engineer to give his decision on points of dispute.

The subject was also discussed by Messrs. E. S. Jarrett, W. C. Briggs, Robert Ridgway, H. B. Seaman, Allen Hazen, G. F. D. Trask, and F. W. Perry.

Preceding the meeting, motion pictures illustrating the Caribou Power Project in the Sierra Nevada Mountains, were shown.

Fourth Sub-Section Conference on Design

Preceding the meeting of the New York Section on November 15th, 1922, the fourth of a series of Sub-Section Conferences was held. The meeting was called to order at the Engineering Societies Building at 5:15 P. M.; James H. Edwards, M. Am. Soc. C. E., in the chair; and present, also, about 25 members of the New York Section. The subject for discussion, "Bridge Specifications and Dr. D. B. Steinman's Proposed Engine Loads", was introduced by Mr. William G. Grove, who was followed by Messrs. D. B. Steinman, H. W. Droelsch, R. Fleming, Richard de Charms, Jr., C. S. Bilyeu, W. E. Rosengarten, O. E. Hovey, H. B. Seaman, and A. W. Carpenter, each of whom discussed briefly some particular phase of the proposed standard bridge specifications. Letters from Messrs. S. J. Ott and S. H. Widdicombe were also presented.

As there was not sufficient time at this meeting to cover the whole subject, it was announced that there would probably be another meeting held soon at which the same subject would be the topic for discussion.

Meeting of the Northeastern Section

A regular meeting of the Northeastern Section was called to order at the Boston City Club, on November 18th, 1922, at 1:00 P. M.; Chairman F. B. Sanborn in the chair; C. W. Banks, Secretary; and present, also, 26 members and guests, including Secretary John H. Dunlap of the Society.

The minutes of the last meeting were read and approved, and an informal report on the membership and financial condition of the Section was made by the Secretary. An informal report of the last special meeting, held on September 9th, 1922, was also made by Chairman Sanborn.

The report of the Executive Committee relative to certain proposed amendments to the Constitution and By-Laws of the Section, was read, and on motion, duly seconded, these amendments were carried without a dissenting vote, with the exception of one to Article III, Section 1, relative to "Dues". On motion, duly seconded, the latter amendment was referred back to the Executive Committee for further consideration and report at the next regular meeting.

The following members of the Section were nominated and elected as a Committee to Nominate Officers for the ensuing year: Messrs. Leonard C. Wason, Frank A. Barbour, Frank M. Gunby, Edward H. Cameron, and Edward W. Howe.

Chairman Sanborn then introduced the Secretary of the Society, Mr. John H. Dunlap, who made an interesting and stimulating address.

Meeting of the Philadelphia Section

A joint meeting of the Philadelphia Section and the Student Chapters of the University of Pennsylvania, Drexel Institute, and Swarthmore College, was held at the Engineers' Club, on November 6th, 1922; President William Easby, Jr., in the chair; Charles H. Stevens, Secretary; and present, also, about 75 members and guests.

Mr. Morris Llewellyn Cooke, Consulting Engineer and former Director of the Department of Public Works of Philadelphia, addressed the meeting on "An Engineer Looks at his World". In the course of his address, Mr. Cooke spoke of the attitude of the engineer toward the young man entering the Profession, and of the need of developing a comprehensive plan to provide means of placing unemployed engineers in touch with positions. He also expressed the idea that engineers should participate in public affairs and particularly in movements for better Government. He concluded with the suggestion that engineers must be optimists, men who can sense the problems of the Nation and of the World, and approach them in the belief that they can be solved.

Secretary Dunlap, of the Society, presented an interesting review of the work of the Society and its relation to the engineer, more particularly of its relation to the younger men of the Student Chapters.

Mr. F. J. Chesterman, Chief Engineer of the Bell Telephone Company of Pennsylvania, also spoke of the duty of the engineer toward the young man entering the Profession.

The meeting was preceded by an informal dinner at the Club in honor of Mr. John H. Dunlap, Secretary of the Society, and among the guests were the officers of the Student Chapters, Past-President George S. Webster, and Director Richard L. Humphrey.

New Officers of the Pittsburgh Section

At the meeting of the Pittsburgh Section held on October 22d, 1922, the following officers were elected for the ensuing year: President, John N. Chester; Vice-President, J. L. De Vou; and Secretary-Treasurer, Nathan Schein.

Meetings of the Portland Section

A Dinner Meeting of the Portland Section was held on October 11th, 1922, at the University Club, with Secretary John H. Dunlap of the Society as the guest of honor. Following the dinner, Mr. Dunlap made a short address during which he discussed the aims and activities of the Society. Mr. Dunlap was followed by Director D. C. Henny who gave an interesting account of his recent trip through Europe, with especial reference to his observations on general conditions of welfare, finance, restoration, and the present status of engineering projects.

Following the dinner, the business meeting was called to order; President F. M. Randlett in the chair; C. P. Keyser, Secretary; and present, also, 28 members and guests.

The reading of the minutes of the previous meeting was dispensed with.

The Secretary presented a communication from Mr. O. G. Hughson, Secretary of the Associated General Contractors, requesting the appointment of a committee of the Section to confer with a similar committee of his Society on methods of bidding on public work with the City of Portland. On motion, duly seconded, President Randlett appointed Messrs. P. H. Dater and Samuel Murray as such Committee.

The Secretary presented a letter from Secretary Dunlap of the Society asking that the Section designate a member on the Sub-Committee on Harbors and Waterways, and President Randlett announced that he had appointed Mr. G. B. Hegardt to serve on this Committee.

Mr. J. C. Stevens reported briefly on the Fall Meeting of the Society held in San Francisco, Calif., in October, 1922, mentioning, among other things, the organization of a Sub-Committee on Irrigation.

Meeting of November 18th, 1922.

A Joint Meeting of the Portland Section and the Student Chapter of the Oregon Agricultural College was held on the Campus at Corvallis, Ore., on November 18th, 1922; President F. M. Randlett in the chair; C. P. Keyser, Secretary; and present, also, 19 members and guests, as well as the officers and 40 members of the Student Chapter.

President Randlett stated that no regular business had been brought before the Section since the meeting in May, 1922. The Secretary reported on a

social meeting held, in June, in Peninsula Park, a dinner meeting, with Alfred D. Flinn, M. Am. Soc. C. E., as guest of honor, in July, and an excursion over the Portland Harbor and Port dredges, in September. No meetings were held in August.

The reading of the minutes of Board meetings since May, 1922, was dispensed with.

The minutes of the meeting of the Section on October 11th, 1922, were read and approved.

The Secretary presented for reference a letter dated April 20th, 1922, from Mr. Elbert M. Chandler, then Acting Secretary of the Society, pertaining to the adoption of a revised Constitution for the Section, a draft of which had been transmitted to the Board of Direction for confirmation. Secretary Keyser explained that further action in the matter had been deferred with the hope of getting the question of Section jurisdiction and membership therein more clearly defined.

On motion, duly seconded, it was decided to make the draft of the revised Constitution conform to the modification recommended by the Board and sent out to ballot for adoption by the Section.

On motion, duly seconded, the question of Section jurisdiction and membership was referred to the original Committee on a Re-Draft of the Section Constitution.

The Secretary presented a communication from Director D. C. Henny quoting a resolution of the Board of Direction, in which voluntary reports on applicants for membership in the Society was requested. Some discussion as to methods of accomplishing this was presented, but no action was taken by the meeting.

The Secretary presented a letter from O. G. Hughson, Secretary of the Associated General Contractors, asking that the Section pass on the merits of paving which the City of Portland is having done, and on motion, duly seconded, it was decided to appoint a committee of three to investigate and report on the matter.

On motion, duly seconded, an amendment to the previous resolution to refer the matter to the Board of Directors of the Section, was carried.

Mr. J. P. Newell presented for consideration by the Section a plan for vacation employment of students of various engineering schools, whereby they might supplement their studies by practical field work, serving as apprentices. The plan was favorably received, but was not fully discussed owing to lack of time.

Mr. George C. Mason addressed the meeting briefly on the affairs of the Society, touching on the subject of "Development" and the establishment of Student Chapters, and defining engineering as the application of common sense.

Director Henny discussed the building and governing of the Society, giving an insight into the duties of a member of the Board of Direction and remarking on the advancement of engineering science within the scope of his memory.

ENTERTAINMENTS DURING JOINT MEETING AT CORVALLIS, ORE.

On November 17th, 1922, the members of the Section were the guests of the Department of Civil Engineering and the Student Chapter of the Oregon Agricultural College at the annual home-coming football rally in the Armory. Following the rally, a smoker was held, at which Professor Sims and Messrs. C. P. Keyser and Kenneth D. Hauser presented interesting speeches. The smoker was presided over by President Virgil Powell of the Student Chapter, with Cadet Col. M. R. Good acting as Master of Ceremonies.

On November 18th, 1922, the morning was spent in witnessing the Sophomore Rook bag rush, and in an inspection of the Engineering Laboratories of the College. Afterward, a luncheon was served, at which the members of the Society and their ladies were the guests of honor. Professor Sims acted as Toastmaster, and addresses were made by Dean Covell, President Randlett, Messrs. Stevens, Henny, and Mason, and President Powell of the Student Chapter. After luncheon, the entire party attended the annual football game between the Oregon Agricultural College and the University of Oregon.

Meeting of the St. Louis Section

The meeting of the St. Louis Section was called to order on September 21st, 1922, at the American Annex; President E. B. Fay in the chair; William C. E. Becker, Secretary; and present, also, 20 members and 4 guests.

The minutes of the previous meeting were read and approved.

Messrs. Baxter L. Brown, Gurdon G. Black, and W. J. Knight were nominated as candidates for the Nominating Committee and unanimously elected.

The death of Robert Moore, Past-President, Am. Soc. C. E., was announced by Mr. Brown, and President Fay appointed Messrs. Brown, Wall, and Rolfe as a committee to prepare a memoir of the late Mr. Moore for publication by the Society.

Secretary John H. Dunlap of the Society, who was present as a guest of the Section, gave an interesting talk on the activities of the Society and the relative position of the engineer in the affairs of the Nation, in which he pointed out the need of the engineer in the solution of many non-technical problems of the day, one in particular, that of Capital and Labor.

Several brief addresses were made by members present, in which hearty approval of closer contact with Society Headquarters was expressed.

Supplementing Mr. Dunlap's address on the activities of the Society, Mr. W. J. Knight presented a paper entitled "Question: Is the American Society of Civil Engineers a Progressive Institution?"

On motion, duly seconded, it was decided to make Mr. Knight's paper the subject for discussion at the next meeting of the Section.

MEETING OF OCTOBER 23D, 1922

The 116th Meeting of the St. Louis Section was held at the American Annex, on October 23d, 1922; President E. B. Fay in the chair; William C. E. Becker, Secretary; and present, also, 21 members and 2 guests.

The minutes of the meeting of September 21st, 1922, were read and approved.

Mr. E. E. Wall announced that the Board of Direction of the Society had instructed the Committee on the Eads Memorial Fund to collect funds by personal solicitation at St. Louis and New Orleans, La.

The discussion on the paper by Mr. W. J. Knight, entitled "Question: Is the American Society of Civil Engineers a Progressive Institution?", was then taken up, and on motion, duly seconded, the following resolution was adopted:

"That the St. Louis Section endorse the recommendations contained in Mr. Knight's paper and that a copy be sent to headquarters and to all the Local Sections urging them to consider these recommendations with a view to some form of expression."

On motion, duly seconded, a resolution was adopted that President Fay appoint a committee to consider the "Schedule of Charges for Professional Services of Consulting and Construction Engineers" with a view toward any revisions or additions in order to bring it up to date, and submit a report thereon to the Section.

New Officers of the St. Louis Section

At the Annual Meeting of the St. Louis Section, the following officers were elected for the ensuing year: President, John T. Garrett; Vice-President, H. J. Pfeifer; and Secretary-Treasurer, William C. E. Becker.

Fall Meeting of the Texas Section

The meeting was called to order at 9:30 A. M., on October 20th, 1922, at the St. Anthony Hotel, San Antonio, Tex.; President E. B. Cushing in the chair; and J. D. Metcalfe, acting as Secretary.

An address of welcome on behalf of the City of San Antonio was presented by Mr. T. A. Ridgeway, City Attorney, to which a reply was made by Mr. E. E. Sands, Vice-President of the Section.

On motion, duly seconded, the business session was postponed until October 21st, 1922.

On motion, duly seconded, it was decided to proceed with the reading of the papers.

A paper by Mr. E. P. Arneson entitled, "Early Irrigation System in Texas", was presented by the author, and the subject was discussed by Messrs. Bartlett, Sullivan, Erwin, and Tamm.

A paper entitled, "Present and Proposed River and Harbor Work in Texas", was read by Maj. L. M. Adams, U. S. Engineer Department, Galveston, Tex., and the subject was discussed by Messrs. Sands, Howe, Richey, and Wickline.

Mr. C. J. Howard, City Engineer of Corpus Christi, Tex., presented a paper on the "Water Supply of Corpus Christi", and the subject was briefly discussed by Maj. J. B. Hawley.

Afternoon Session of Meeting of October 20th, 1922

At the afternoon session, a paper on "Strength of Concrete", was read by Professor F. E. Giesecke, the subject being discussed by Messrs. Sands, Noyes, Davis, and Cone.

The meeting adjourned at 4:30 P. M., in order to allow the members present to visit various points of engineering interest around San Antonio.

Dinner at Fall Meeting, October 20th, 1922

At 7:30 P. M., the visiting members were entertained by the local members at a Mexican dinner at the St. Anthony Hotel, which was followed by dancing.

Meeting of October 21st, 1922

The Third Session of the Fall Meeting was called to order at the St. Anthony Hotel, on October 21st, 1922; President E. B. Cushing in the chair; and E. N. Noyes, Secretary.

A paper by Mr. G. G. Wickline, Bridge Engineer of the State Highway Department, entitled, "The Bridge Problems of the State Highway Department", was presented by the author, and the subject was discussed by Messrs. Page, Sullivan, Cone, McLendon, Bartlett, and Jowers.

Secretary Noyes presented a paper on the "Run-Off Studies of 6 000 Square Miles of Drainage Area of the Trinity River", which was discussed by Messrs. Bartlett and Davis.

The discussion was followed by a brief paper on "Mosquito Control" by Mr. H. R. F. Helland, and Judge John W. Gaines, of San Antonio, presented an interesting address on the subject of "Water Conservation".

The Annual Report of the Secretary was received.

A report was made by President Cushing who reviewed the work done during the past year, the use of the Standard Form of Agreement as prepared by the Section, the activity of the Technical Club of Dallas on the water supply of Dallas, the work of the Governor's Advisory Council on Conservation, the publication of papers for discussion, etc., etc.

The following committee was appointed by President Cushing to review the reports of the officers for the past year: Messrs. A. J. Wise, C. H. Kearney, O. H. Koch, W. W. McLendon, and A. Tamm.

On motion, duly seconded and carried, the President was authorized to appoint a committee with power to prepare a budget covering the expenses of the Section for the coming year.

On motion, duly seconded, and carried unanimously, the President was authorized to notify the Society that the Texas Section is opposed to any division of the State of Texas in connection with re-districting.

On motion, duly seconded, a vote of thanks was extended to the San Antonio members of the Section for the entertainment provided for visiting members.

The following officers were elected for the ensuing year: President, E. E. Sands; First Vice-President, A. J. McKenzie; and Second Vice-President, John A. Norris.

After the meeting was adjourned, the visiting members were taken on a trip to Lake Medina where they were entertained by the San Antonio members.

Resolutions Adopted by the Texas Section at the Fall Meeting

The following resolutions were presented and adopted at the meeting of the Section on October 21st, 1922:

(1) *"Whereas,* Hon. Pat M. Neff, Governor of Texas, has appealed to the engineers of the State to lend their active support, as citizens and engineers, to the movement for the protection of our natural resources, and the advancement of the reclamation and flood control movement, and

"Whereas, The Governor's Advisory Council, in session at Waco on August 16th, 1922, formally endorsed the organization, by the citizens of the State of the Texas Conservation Association, and expressed approval of the plans of that body for reclamation and flood control,

"Therefore, Be It Resolved by the Texas Section of the American Society of Civil Engineers, that we cordially endorse the movement for reclamation and flood control as advanced by the Texas Conservation Association in its Waco meeting, and approve its plans for necessary legislation and adequate appropriations for the collection of the necessary engineering data."

(2) *"Be It Resolved* by the Texas Section of the American Society of Civil Engineers, that we express our sincere regret at the death of our former President and faithful co-worker, Mr. C. H. Chamberlin, recognizing the service which he has rendered this body in its infancy and growth and that the Secretary be instructed to forward a copy of this resolution to Mrs. Chamberlin."

(3) *"Resolved* That the Executive Committee and the Secretary be directed to prepare and adopt a Budget for the annual expense of the Texas Section."

(4) "In view of the fact that the present State laws are inadequate in that they do not give to the State Highway Department the necessary supervision and control and expenditure of funds for the design and construction of the roads and bridges of the State; and in view of the fact that this authority must be properly vested in the State Highway Department to enable Texas to continue to be eligible to receive Federal aid in the construction of highways and bridges,

"Be It Resolved That the President of the Texas Section, American Society of Civil Engineers, appoint a committee of three men to confer with the State Highway Engineer in formulating recommended legislation to be presented to the committee of the Legislature on Roads, Bridges and Ferries."

(5) *"Be It Resolved* That the chair appoint a committee of seven (7) including the three members of the State Board of Water Engineers, to study and report upon spillway and wasteway dimensions, reporting to the Spring Meeting."

(6) *"Be It Resolved* That the chair appoint a committee of seven (7), including the three members of the State Board of Water Engineers, to study and report on spillway and waterway dimensions, reporting to the Spring Meeting."

MINUTES OF MEETINGS

OF THE BOARD OF DIRECTION

This is an abstract of the notes of the Secretary and subject to approval by the Board of Direction at its next meeting.

December 4th, 1922.—The Board convened in regular meeting at 8:15 P. M., at the Headquarters of the Society; President John R. Freeman in the chair; John H. Dunlap, Secretary; and present, also, Messrs. Greene, Holland, Humphrey, Hunt, Pegram, Ridgway, and Yates.

Ballots for membership were canvassed, resulting in the election of 19 Members, 40 Associate Members, 2 Affiliates, and 30 Juniors, and the transfer of 12 Juniors to the grade of Associate Member.

Thirty-one Associate Members were transferred to the grade of Member.

A report from the Membership Committee was received and acted on.

Adjourned.

MINUTES OF MEETINGS OF SPECIAL COMMITTEES TO REPORT ON ENGINEERING SUBJECTS

Joint Committee on Stresses in Railroad Track

(Abstract)

October 27th and 28th, 1922.—Three sessions of the Joint Committee on Stresses in Railroad Track were held in the Library of the American Railway Association, Chicago, Ill. Present, A. N. Talbot (*Chairman*), G. H. Bremner, Mr. Bronson, representing Dr. P. H. Dudley, W. J. Burton, Charles S. Churchill, W. C. Cushing, M. H. Doughty, representing G. J. Ray, W. M. Dawley, J. B. Jenkins, George W. Kittredge, Paul M. LaBach, C. G. E. Larsson, Albert F. Reichmann, Earl Stimson, F. E. Turneaure, and J. E. Willoughby. There were also present by invitation C. F. W. Felt, M. Am. Soc. C. E., Chief Engineer, and C. T. Ripley, Chief Mechanical Engineer, of the Atchison, Topeka and Santa Fé Railway System.

The preliminary draft of the Third Progress Report, which was sent out to the members of the Committee on October 2d, 1922, was read and discussed in detail, after which minor modifications and additions were made. On motion, duly seconded, the Chairman was authorized to put these changes in form and present the Progress Report.

Plans for future work were outlined and discussed, and the appointment of a sub-committee to confer on the subject of canting of rails with Sub-Committees of the Committee on Rails and the Committee on Track of the American Railway Engineering Association, was authorized.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 6 P. M., and from 7 P. M. to 10 P. M., every day, except Sundays, New Year's Day, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 5 P. M.

ANNUAL MEETING

The Seventieth Annual Meeting will be held at the Headquarters of the Society, 33 West 39th Street, New York City, on Wednesday, Thursday, and Friday, January 17th, 18th, and 19th, 1923.

The Committee on Technical Activities and Publications is in charge of the arrangements for the Annual Meeting and is assisted by the following Local Committee:

CHARLES GILMAN, *Chairman*,

WILLIAM G. GROVE, T. R. KENDALL,
BURT B. HODGMAN, GEORGE L. LUCAS,
CHARLES M. HOLLAND, THADDEUS MERRIMAN,
JAMES F. SANBORN.

The Business Meeting will be called to order at 10 A. M., on Wednesday morning. The Annual Reports will be presented, the result of the canvass of the ballots for Officers announced, Reports of Special Committees presented, Medals and Prizes awarded, Honorary Membership conferred with formal appropriate ceremonies, and other business transacted.

A program giving the details of the meetings, excursions, etc., has been issued to the membership.

FUTURE MEETINGS

February 7th, 1922.—8 P. M.—A regular business meeting of the Society will be held, the program for which will be announced later.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 26 of the Year Book for 1922.

NEW LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

The Constitutions of the following Local Sections have been approved by the Board of Direction since the list was prepared for the 1922 Year Book, pp. 41 *et seq.*

Dayton Section (Constitution Approved by Board, 1922).

Charles H. Paul, President; K. C. Grant, Secretary-Treasurer, Winters Bank Building, Dayton, Ohio.

Lehigh Valley Section (Constitution Approved by Board, 1922).

George H. Blakeley, President; M. O. Fuller, Secretary-Treasurer, 732 Avenue H, Bethlehem, Pa.

Sacramento Section (Constitution Approved by Board, 1922).

Albert Givan, President; Joseph W. Gross, Secretary, Forum Building, Sacramento, Calif.

Toledo Section (Constitution Approved by Board, 1922).

M. J. Riggs, President; George N. Schoonmaker, Secretary-Treasurer, 716 Stickney Avenue, Toledo, Ohio.

Virginia Section (Constitution Approved by Board, 1922).

J. C. Carpenter, President; James F. MacTier, Secretary-Treasurer, 1312 Maple Avenue, Roanoke, Va.

NEW STUDENT CHAPTERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS*

The following Student Chapters have been authorized by the Board of Direction since the list was prepared for the 1922 Year Book, pp. 46 *et seq.:*

Clemson Agricultural and Mechanical College of South Carolina.

J. H. Baumann, President; W. J. Stribling, Secretary, Clemson Agricultural and Mechanical College of South Carolina, Clemson College, S. C.

Georgia School of Technology.

F. H. Harrison, President; C. M. Kennedy, Jr., Secretary, 91 West North Avenue, Atlanta, Ga.

Lehigh University.

H. S. Ertner, President; J. H. Van Ness, Secretary, 223 Summit Street, Bethlehem, Pa.

North Carolina State College of Agriculture and Engineering.

H. L. Fisher, President; A. S. Gay, Secretary, North Carolina State College, Raleigh, N. C.

Norwich University.

J. H. Kane, President; Allen J. Hamilton, Secretary, Norwich University, Northfield, Vt.

Stadia Club (University of Oklahoma).

Lester W. Ellis, President; Edward W. Mars, Secretary, University of Oklahoma, 734 DeBarr Street, Norman, Okla.

University of Virginia.

T. B. Kiener, Secretary, Box 423, University, Va.

Worcester Polytechnic Institute.

Carl F. Meyer, President; Albert P. Hayden, Secretary, Worcester Polytechnic Institute, Worcester, Mass.

* By a recent ruling of the Board of Direction, the minimum membership of a Student Chapter has been fixed at 12 instead of 20.

MEMBERSHIP

(From October 28th to December 5th, 1922)

ADDITIONS

MEMBERS

		Date of Membership.
ACKERMAN, ALEXANDER SEYMOUR. Capt., Corps of Engrs., U. S. A., 11th Engrs., Corozal, Canal Zone, Panama	Jun.	April 30, 1907
	Assoc. M.	April 6, 1909
	M.	Oct. 3, 1922
ALBERT, GEORGE LINCOLN. Cons. Hydr. Engr., Box 315, Dayton, Ohio		Oct. 2, 1922
DAVIS, GEORGE JACOB, JR. Dean and Prof. of Civ. Eng., Univ. of Alabama, University (Res., Pinehurst, Tuscaloosa), Ala	Jun.	Nov. 4, 1902
	Assoc. M.	Oct. 2, 1907
	M.	Oct. 3, 1922
DORROH, JOHN HAZARD. Dean, School of Eng., Univ. of Mississippi, University, Miss		Oct. 2, 1922
FERGUSON, GARWOOD. County Engr., Passaic County, Court House, Paterson, N. J		May 8, 1922
HANNAH, MANTON. County Engr., Court House, Waco, Tex.	Jun.	Nov. 1, 1910
	Assoc. M.	Sept. 2, 1914
	M.	Oct. 3, 1922
HOWLAND, BENJAMIN FRANKLIN. Care, Hilo Sugar Co., Hilo, Hawaii		Oct. 2, 1922
HUSBAND, JOSEPH. Prof., Civ. Eng., Sheffield Univ., Sheffield, England		Oct. 2, 1922
LATIMER, CLAUDE ALFRED. Civ. Engr., Board of Public Works, City Hall (Res., 1677 Northampton St.), Holyoke, Mass	Jun.	Oct. 31, 1911
	Assoc. M.	Oct. 14, 1919
	M.	Oct. 3, 1922
MCCANDLISS, EDGAR SCOTT. Cons. Engr., Western Paving Brick Mfrs. Assoc., 418 Dwight Bldg., Kansas City, Mo. (Res., 216 Tyler St., Topeka, Kans.)	Assoc. M.	June 3, 1915
	M.	Oct. 3, 1922
MORRIS, RICHARD HENRY. Cons. Engr., 911 Commercial Trust Bldg., Philadelphia, Pa		Aug. 28, 1922
MORRIS, SAMUEL BROOKS. Supt. and Chf. Engr., Pasadena Water Dept., City Hall, Pasadena, Calif.	Jun.	Mar. 2, 1915
	Assoc. M.	April 14, 1919
	M.	Oct. 3, 1922
MURRAY, EVERETT BODMAN. Capt., Corps of Engrs., U. S. A., 2d Engrs., Camp Travis, Tex	Assoc. M.	April 2, 1913
	M.	Oct. 3, 1922
RADER, RALPH DENNIS. Dist. Engr., State Highway Comm., Bozeman, Mont	Assoc. M.	Jan. 19, 1920
	M.	Oct. 3, 1922
WATERMAN, EARLE LYTTON. Associate Prof., of San. Eng., State Univ. of Iowa, 104 Eng. Hall, Iowa City, Iowa	Assoc. M.	Sept. 11, 1917
	M.	Oct. 3, 1922

ASSOCIATE MEMBERS

BRINGHURST, HORACE MORTON. Care, Paul J. Kalman Co., 22 West Monroe St., Chicago, Ill	Jun.	Nov. 12, 1913
	Assoc. M.	June 19, 1922
CANAVAN, FRANCIS PAUL. Architectural Engr., 7032 Greenway Ave., Philadelphia, Pa		Aug. 28, 1922

ASSOCIATE MEMBERS—(*Continued*)

		Date of Membership.
COLABAWALA, JEHANGIR RUTTONJEE. Executive Engr., Bombay Development, Matunga, Bombay, India		Aug. 28, 1922
COX, JOEL BEAN. Engr. with East Maui Irrig. Co., Paia, Maui, Hawaii	Jun.	Mar. 13, 1917
	Assoc. M.	Aug. 28, 1922
FUSTON, WALTER J. Structural Engr., 1309 Southwestern Life Bldg., Dallas, Tex		Oct. 2, 1922
HUGHES, JOSEPH EDWIN. With Panama Canal, Box 141, Balboa Heights, Canal Zone, Panama		Aug. 28, 1922
KEEFER, CLARENCE EDWARD. Asst. Designing Engr., Sewer Div., City Hall Annex No. 1 (Res., 1720 Bolton St.), Baltimore, Md	Jun.	June 1, 1920
	Assoc. M.	Oct. 2, 1922
LING, HUNG HSUN. Care, The Great China Corporation, 37-B Canton Rd., Shanghai, China	Jun.	Oct. 8, 1918
	Assoc. M.	June 19, 1922
LOIDA, JOSEPH LOUIS. Asst. Engr., St. Louis, Troy & East. R. R., 314 North 4th St. (Res., 2930ª South Compton Ave.), St. Louis, Mo	Jun.	June 23, 1916
	Assoc. M.	June 19, 1922
LUNDGREN, GUSTAF HARALD. Chf. Designer, Boving & Co., Ltd., 56 Kingsway, London, W. C. 2, England		June 19, 1922
MARTIN, JOHN DICKERSON. Chf. Engr., Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa		June 19, 1922
ORTHEY, GEORGE FREDERICK. Asst. Engr. of Tests, Dept. of Civ. Eng., Columbia Univ., New York City (Res., 42 Covert St., Brooklyn, N. Y.)		May 8, 1922
STRANBERG, EDWIN LEONARD. Structural Engr., 334 Pioneer Bldg. (Res., 7018 Palatine Ave.), Seattle, Wash		Oct. 2, 1922
THOMAS, ROBERT ELLSWORTH. Lt. (C. E. C.) U. S. N., Quarters S, Navy Yard, Mare Island, Calif		Oct. 2, 1922
WILSON, DEE LELAND. Town Engr. of Cocoanut Grove, Box 541, Miami, Fla	Jun.	Nov. 4, 1914
	Assoc. M.	May 8, 1922

JUNIORS

DAVIS, HAROLD LAMBUTH. 2034 Durant Ave., Berkeley, Calif	Oct. 2, 1922
KAPP, CLARENCE RAMSEY. Project Engr., Nebraska State Highway Dept., Box 341, Rushville, Nebr	Aug. 28, 1922
MCCREERY, DONALD HULL. 185 North Catalina Ave., Pasadena, Calif.	Oct. 2, 1922
MONROE, ROBERT LOUIS. 26 Benton St., Trenton, N. J	Aug. 28, 1922
PICTON, WALTER LAMBUTH. Office, Engr., B. H. Klyce, 720 Fourth and First National Bank Bldg., Nashville, Tenn	Oct. 2, 1922

REINSTATEMENTS

ASSOCIATE MEMBERS

	Date of Reinstatement.
WHITCRAFT, LEWIS NORRIS	Nov. 17, 1922

RESIGNATIONS

MEMBERS

	Date of Resignation.
HARPER, EDGAR AMBLER	Nov. 17, 1922

ASSOCIATE MEMBERS	Date of Resignation.
KLEIN, ALBERT ROBERT	Nov. 17, 1922

DEATHS

BORDEN, HENRY PERCY. Elected Member, May 13th, 1918; died October 19th, 1922.

BRYANT, BYRON HARKNESS. Elected Member, September 6th, 1910; died July 8th, 1922.

CLARK, EDWARD WHITE. Elected Fellow, April 8th, 1870; date of death unknown.

GEMMELL, ROBERT CAMPBELL. Elected Associate Member, October 5th, 1892; Member, December 4th, 1895; died October 25th, 1922.

GRANTHAM, HERBERT THOMAS. Elected Associate Member, February 5th, 1896; Member, May 7th, 1902; died October 4th, 1922.

HALL, HERMAN. Elected Member, March 14th, 1916; died September 28th, 1922.

LATHBURY, BENJAMIN BRENTNALL. Elected Associate Member, March 3d, 1897; Member, June 6th, 1905; died November 10th, 1922.

LAU, PERCY MAPES. Elected Associate Member, September 12th, 1916; died September, 1922.

NEWBERRY, SPENCER BAIRD. Elected Associate Member, January 6th, 1897; died November 28th, 1922.

NEWMAN, ROBERT MORRIS. Elected Member, May 6th, 1874; died November 13th, 1922.

RAPP, PHILIP. Elected Associate Member, March 12th, 1918; died June 25th, 1922.

ROCKWOOD, ARTHUR JONES. Elected Member, February 1st, 1905; died November 2d, 1922.

SCRIPTURE, ARTHUR MARQUIS. Elected Associate Member, June 3d, 1896; Member, January 5th, 1904; died March 8th, 1922.

SLAYBACK, CLINT SANFORD. Elected Member, March 7th, 1921; died October 26th, 1922.

TAYLOR, EDWARD BALLINGER. Elected Member, September 3d, 1884; died November 8th, 1922.

UHLER, WILLIAM DAVID. Elected Associate Member, May 6th, 1908; Member, March 1st, 1910; died October 27th, 1922.

Total Membership of the Society, December 5th, 1922

Members	**4 655**	
Associate Members	**5 264**	
Corporate Members		**9 919**
Honorary Members		**11**
Juniors		**472**
Affiliates		**168**
Fellows		**9**
Total		**10 579**

ENGINEERING SOCIETIES EMPLOYMENT SERVICE

An Engineering Societies Service Bureau was established December 1st, 1918, as an activity of Engineering Council. It was managed by a board made up of the Secretaries of the four Founder Societies, and funds for its maintenance were provided by these Societies. On January 1st, 1921, this Bureau was taken over by The Federated American Engineering Societies and was known as the Employment Service of that organization. Recently, the management of the Service has been taken over by the Founder Societies. A weekly Employment Bulletin, listing the positions available, may be seen at the office of any Secretary of a Local Section. Members of the American Society of Civil Engineers who desire to register should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings*, copy must be received on or before the first of each month. All communications should be addressed to Mr. Brown, giving number of position, name, address, and membership in Engineering Society.

EMPLOYMENT BULLETIN

POSITIONS AVAILABLE

IRRIGATION ENGINEER as Assistant for determination of seepage losses in irrigation canals. Should be capable of observing and noting conditions influencing the tests; should be in good health, willing to work, and should have had experience in measuring the discharge of canals and small streams. Application by letter. Salary not stated. Location, Texas. V–2792.

PROFESSOR for head of Department of Civil Engineering. Do not apply unless willing to accept when definite offer is made. Application by letter. Salary $2 700 for nine months with additional sum not exceeding $75 paid at end of first year of service for traveling expenses. Location, West Indies. V–2795.

SUPERINTENDENT of Bag Factory located in St. Louis, Mo. Want to secure man who has had technical training, and one with some experience in production work, who hopes to specialize in manufacturing and human control. Application by letter. Salary not stated. V–2840.

DRAFTSMAN to design and lay out building construction, structural steel, calculate stresses, lay out equipment, and inspect construction and installation. 5 to 6 years' experience in cotton-seed oils and soap. Application by letter. Salary $175 to $300. Location, New York City. V–2855.

PHYSICISTS: Large industrial research laboratory needs physicists with graduate training and capabilities for carrying on and directing investigations along following lines, (*a*) dielectric and general insulation research; (*b*) heat flow, fluid flow, and dimensional changes. Application by letter, giving full particulars as to age, training, experience researches done, and personal references. Salary not stated. Location, Pa. V–2859.

GENERAL MANAGER for New York Engineering Company having in hand and nearly all financed, railroad and other developments in two foreign stable countries, possessing valuable exclusive rights and grants in connection therewith, and needing temporary capital to keep going until put over. No limit to age either way if can supply the few thousands needed for next few months to hold engineers and promoters. If active interest in enterprises is desired can have anything wanted and organize to suit, in co-operation present staff. Further particulars and complete information to right party. Application by letter. Location, New York City. V–2884.

ARCHITECT'S SUPERINTENDENT, familiar with hotel, residential, and office building work. Must be familiar with ornamental plastering, plumbing, etc.; age 35 to 45 years. Application by letter. Salary $50 to $65. Location, New York City. V–2889.

FIRST-CLASS STRUCTURAL STEEL POWER HOUSE CHECKERS. Application by letter. Salary not stated. Location, New York City. V–2911.

DRAFTSMAN with technical education and practical experience for design of power plants, heating, ventilating, plumbing, electric light and power wiring, and refrigerating systems usually installed in office, hotel, hospital, theatre, apartment, and industrial buildings. Service to begin

about November 15th with good salaries and long engagements. Can assure a pleasant surroundings and unusually good working conditions. Application by letter. Location, New York City. V–2914.

ENGINEER preferably between ages of 25 and 35 who has had both technical and practical experience, the latter along electrical construction line. Opening is in Construction Dept. for an Estimator who should be of sufficient experience and capacity to qualify later on as an executive with company with the opportunity of sometime in the future being head of Construction Dept. Application by letter. Salary $150 to $175 to start. Location, Missouri. V–2919.

GRADUATE CIVIL ENGINEER, having several years' experience in responsible municipal work, covering particularly pavements and drainage. Familiarity with special assessment procedure in the State of Illinois will be considered advantageous. Application by letter. Location, Illinois. V–2923.

GRADUATE CIVIL ENGINEER about 30 years of age, with several years' business experience, including highway work, wanted to promote sales of well established products by corporation in business for many years. In reply, give full details of experience with each former employer; state whether married or single, salary desired; alma mater; height; weight; character references, and loan photograph. Location, Ohio. V–2924.

MECHANICAL DRAFTSMAN familiar with power house design. Knowledge of structural steel, piping, etc. essential. Application by letter. Salary not stated. Location, New York City. V–2927.

INSTRUCTOR IN MATERIALS OF ENGINEERING. Permanently from January 1st, 1923, for classroom and laboratory work, with desire to specialize in teaching and research work in this subject. Man under 30 preferred. Application by letter, giving references, education, training, and recent photograph. Salary not stated. Location, Ohio. V–2932.

ENGINEER with wide experience in design of high efficiency centrifugal pumps. Application by letter stating qualifications, fully, salary expected, references and when available. Location, New York State. V–2953.

SALESMEN (5 or 6) lubricating oil. High-class men at least 30 to 35 years of age. Men with knowledge of turbines, engines and other lubricating. Application by letter. Salary $200 per month and expenses to start. Location, 1 in Boston, 1 in Philadelphia, 3 or 4 in New York City. Headquarters, New York City. V–2963.

SECRETARY of Local Builders Exchange in a live city, requires publicity experience, ability to mix well, knowledge of building game and understanding of buildings, and principles of co-operation and confidence in ability to make a real service out of a job invaluable to members. While having secretarial training, man should preferably have some construction or engineering training also. Work is excellent, contact with representative firms in those cities and should lead to bigger opportunities. Application by letter stating age, education, and experience. Salary not stated. Location, South and Mid-West. V–2971.

DRAFTSMAN for general industrial plant layout work, including designing and detailing elevating and conveying machinery, structural steel, and reinforced concrete. Application by letter. Salary not stated. Location, Pa. V–2981.

SALESMAN to sell machinery. Technical education. Grinding machinery. Sales experience essential. Application by letter, stating age, education, and experience. Salary not stated. Location, Traveling. V–3008.

SALES ENGINEER. Power plant equipment in general and steam-jet conveying in particular. Some marine experience also desirable. Salary not stated. Location, New York City. V–3009.

RESIDENT ENGINEER, C. E. or M. E., to handle layout, inspection, and cost on steam plant of 15 000-kw. capacity. Must be thoroughly experienced in concrete work, steel inspection, brick work, boiler setting work, boiler erection, piping and setting of machinery. Application by letter. Salary not stated. Location, North Carolina. V–3010.

DESIGNER with structural steel experience; man who has been with fabricating steel company preferred. V–3011.

GAS MANAGER OR SUPERINTENDENT, for combination coal and water gas property in city of 30 000 population. Should be thoroughly familiar and experienced in both coal and water-gas manufacture and gas distribution and service. Application by letter giving detailed statement of experience and education, references, and salary expected. Also advise age, nationality. Location, Southeastern United States. V–3014.

SALES ENGINEER (4) to sell white Portland cement. Several years' construction experience necessary. Age from 25 to 35. One for New York, one for Western New York, one for Boston, and one for Philadelphia. Application in person by appointment. Salary depends on man. Salary and expenses. Headquarters, New York City. V–3019.

YOUNG TECHNICAL SCHOOL MAN, preferably graduate in mechanical, civil, or electrical engineering, say, of Class of 1921, to learn pneumatic tubes. Work is to assist engineers on street and station construction. Advancement will depend wholly on man. Application by letter. Location, New York City. V–3034.

FIELD MEN in Eastern States for educational and promotional work in connection with well known basic building material. Sales experience desirable. Practical familiarity with building construction and engineering necessary, with knowledge of masonry, plaster, and concrete work and practice. Technical training desirable. Permanent positions with good prospects. Application by letter, giving full details. Salary not stated. V–3035.

INSTRUCTOR in physics, beginning January 1st, 1923, until middle of September. Man of some previous experience, if possible, but an advanced degree is not necessary. Application by letter. Salary not stated. Location, New York City. V–3036.

STRUCTURAL and MECHANICAL DRAFTSMAN and DESIGNER capable of acting as Squad Boss. Application by letter, giving age, details of past experience, and technical education. Location, Pa. V–3040.

COMPETENT MINE SURVEYOR, which job will last about 3 or 4 months, after which there might be a chance for some other position with Company. Man who has had experience in underground surveying, although one who has had general experience would do. Also be required to make mine maps and should be good draftsman. Application by letter. Salary $150 to $175 a month. Location, Vermont. V–3055.

MAINTENANCE ENGINEER experienced in forging and rolling mill. Application in person. Salary not stated. Location, New Jersey. V–3056.

SALES ENGINEERS. Sound business men with some civil engineering education and experience who have demonstrated ability to organize a sales force to cover an extensive amount of territory. Remuneration will be on a strictly commission basis large enough to warrant an alive man to make from $7 000 to $12 000 during first year. It will be necessary for man to finance himself for a period of 2 to 4 months before he can expect sufficient returns to carry his organization. Application by letter, giving full history of experience and previous connections, age, nationality, and religion. Headquarters, New York City. V–3057.

SALESMEN (2 or 3). Young men for junior salesmen to work out of New York Office in metropolitan territory. These men will be paid small drawing account and a liberal commission and should be able to earn from $3 000 to $4 000 first year. Should have either combination of engineering and selling experience or considerable experience along the line of selling, advertising, and publicity. Major portion of work in New York territory will be selling of oblique or perspective view to large industrial plants and owners of private estates as well as to advertising agencies. Junior salesmen will be given opportunity to develop and demonstrate ability with idea of taking over outside territory as territorial sales agents or of being assigned to outside territory as territorial sales managers. Application by letter, giving full account of business history, as well as age and nationality. Headquarters, New York City. V–3058.

DRAFTSMAN for general mechanical work in chemical plant. Application by letter, stating age, education, and experience. Salary not stated. Location, Pa. V–3066.

COOPERAGE SUPERINTENDENT. Company manufactures 1 000 bbl. per day (liquid and non-liquid proof barrels). Standard Holmes Machine used. Familiar with all details of barrel manufacture. Application by letter, stating age, education, and experience. Salary not stated. Location, New Jersey. V–3070.

CONSTRUCTION FOREMAN for work in feldspar grinding mill. Expect to have this mill grinding within next four or six weeks, some heavy machinery still remaining to be installed. After completion of mill, man would probably be used as mill foreman. Mill will have capacity of 72 tons per 24 hours, is electrically driven, part of installation being gyratory crushers, rolls, conical tube mills, dryer, etc. Application by letter. Salary $125 to $150 per month to start. Location, Connecticut. V–3074.

SALES ORGANIZATION to handle account in the New York territory. We are manufacturers of all types of elevating and conveying machinery. Application by letter. Salary not stated. Headquarters, Philadelphia, Pa. V–3076.

MANUFACTURER WANTS PRODUCT. An old established manufacturer with foundry, machine shop and wood-working department, wants additional products of merit to manufacture. Would consider (1) outright purchase of products of merit; (2) manufacture and sale on royalty; (3) manufacturing for established sales organization; (4) manufacturing on contract. V–3077.

LIBRARIAN with library training, reading knowledge of German and French. Technical knowledge of chemistry and metallurgy. Application by letter. Salary not stated. Location, Pennsylvania. V–3078.

HIGH CLASS EXPERIENCED ARCHITECTURAL DRAFTSMAN. Application in person. Salary not stated. Location, New York City. V–3080.

COMPETENT CIVIL ENGINEERING DRAFTSMAN. Will work in office under supervision so it is not entirely necessary that he should be an engineer, although would much prefer that he should have this training. Application by letter. Salary not stated. Location, Pa. V–3086.

SENIOR DRAFTSMAN, who is familiar with map work. If man proves to be suitable, will have an opportunity to build up a Bureau of Maps and Records and be head of this branch of the Inspection Department. Application by letter. Salary not stated. Location, New York State. V–3089.

YOUNG MAN to take charge of warehouse, who is not afraid to pack some goods and make shipments when rushed, but ordinarily would have helpers to do this, while he would keep track of stock, inventory, shipments, etc. Position would be in a small town in New York State, but if capability is shown will later have charge of not only this particular warehouse, but installation and supervision of three and possibly four others which may be installed late this winter. Opportunity to work up in rapidly growing concern. Man should have some warehouse experience, so that he will know how shipments should be packed and also details of making shipments to railroad, as he will have to depend on his own responsibility for those matters. Could hardly consider any one without warehouse and shipping experience at all, although it is not necessary that he have experience in shipping the particular line of products which are handled, namely, oils, greases, and automobile accessories. Application by letter. Salary $1 600–$1 700 to start. Location, New York State. V–3092.

JUNIOR SALESMAN of technical training for sales work on storage batteries, specializing particularly as applied to electric street trucks, industrial trucks, and storage battery locomotives. Application by letter. Salary $1 800 to $2 400. Location, Eastern United States. V–3094.

MECHANICAL ENGINEER with fire protection experience. Application by letter, stating age, education, and experience in detail. Salary not stated. Location, New York City. V–3095.

SALESMEN for Albany, grease and oils. Metropolitan Area. Should have some knowledge of machinery. If successful in developing trade will give him Metropolitan Territory. Application in person. Drawing account of $25 per week against commission. Headquarters, New York City. V–3096.

PARTNER with engineering ability ready to invest minimum of $35 000, part of which may be paid from earnings, desired for long established prosperous business in special machinery. Founder of business unable properly to care for present organization and expansion. Application by letter. Location, New York City. V–3098.

EASTERN SALES MANAGER for company manufacturing varnish, winding coils. Graduate engineer. Traveling position. Application by letter. Salary not stated. Location, New England. V–3104.

MECHANICAL AND POWER ENGINEER, experienced in power plant practice, operation, calculations, utilization, and departmental distribution of power, steam, water, coal, etc., in large manufacturing plant in Wisconsin. Application by letter, stating age and salary expected, experience in detail. V–3105.

CIVIL ENGINEER to act as Assistant Engineer. Must have had experience in layout of structural steel as applied to power plants. Prefer man of 30 years. Application in person. Location, Conn. V–3106.

STRUCTURAL STEEL DETAILER, preferably with power plant experience. Application in person. Location, Conn. V–3107.

YOUNG MAN to act as Technical Assistant to Plant Betterment Engineer in New York office. Duties of assistant would consist to large extent of the study of plant records as to performance and operating costs, test reports of boilers, turbines, etc., and by means of curves and tabulations placing it in convenient shape for use of interested parties. Some general engineering calculations would be involved and, in particular, knowledge of boiler heat balance computations would be helpful. Work requires some technical training and applicants with experience in work of this nature are preferable. Application by letter, stating age, education and experience. Salary not stated. Location, New York City. V–3111.

GRADUATE M. E. or C. E. with 2 or 3 years' experience, preferably along combustion lines. Field work, testing, office work, etc. Application by letter (typewritten). Salary not stated. Location, Pa. V–3116.

DRAFTSMAN. Room and board at Company Boarding House, $9 per week. House furnished to married man. Commissary store and good school on property. Duties will consist in design and drafting of structures and equipment common to phosphate mine and mill. Must be well grounded in structural mechanics, familiar with details of shop methods, fabrication, and field erection, and have had at least 2 years' drafting room experience with recognized engineering firm. Will be required to make computations for design of structural members for live and dead loads, draft design and make tracings and blue prints. Must be capable of making neat, well executed tracings and be good penman in free-hand lettering. Application by letter. Salary $150 to $175 per month, dependent on capabilities. Transportation furnished and permanent for right man. Location, Florida. V–3118.

FIRST CLASS ESTIMATOR on hotel and commercial buildings. Only experienced building estimator considered. V–3130.

DESIGNING DRAFTSMAN with heating and ventilating experience. Engineers with this experience only will be considered. Location, New York City. V–3131.

MAN to open sales agency and invest $5 000. Application in person. Location, New York City. V–3137.

ASSISTANT PROFESSOR of Practical Mechanics in charge of mechanical drawing. Location, Middle West. V–3138.

CIVIL ENGINEERING GRADUATE, 2 years' practical experience since leaving college, to work in municipal design office on waterworks. Must be resident of New Jersey. Application by letter, stating age, education, and experience. Salary $2 100. Location, New Jersey. V–3157.

FIRST-CLASS DRAFTSMAN on water supply work and civil engineering drawings, rapid worker and first class tracer. Must be resident of New Jersey. Application by letter, stating age, education, and experience. Salary $2 400. Location, New Jersey. V–3158.

CIVIL ENGINEERING GRADUATES (40). 26 years of age maximum, unless with military service. Registration examination required. Application by letter. Salary $2 000 per year. Location, not stated. V–3168.

ENGINEER familiar with pavement construction and design. Only engineers with this experience considered. Application by letter, stating age, education, and experience. Salary not stated. Location, New Jersey. V–3171.

MEN AVAILABLE

EXECUTIVE ENGINEER, Assoc. M. Am. Soc. C. E.; age 40; married. General industrial and commercial training of responsible nature. Experience: Engineer with contractors; Superintendent of Construction for large manufacturing corporation; Chief Engineer in Far East, for well known oil company; Executive Engineer and Foreign Representative, organization, sales (steel products, structural steel, heavy chemicals), prominent metal company. Excellent credentials. Further details on request. CE–377.

CIVIL ENGINEER, M. Am. Soc. C. E.; age 41; married. Desires position teaching mathematical or engineering subjects; seventeen years' varied experience in heavy railroad and highway construction, hydraulic and hydrographic engineering, and some experience in teaching. CE–378.

WATER-WORKS ENGINEER AND MANAGER, Assoc. M. Am. Soc. C. E.; married; health perfect; technical education. Seventeen years' active practice in design, construction, and operation of about fifteen water companies. Charge of water purification and efficient operation of pumping plants. Wants to hear of opportunity of similar character or opportunity where experience as given can be used. CE–379.

WORKS MANAGER, familiar with sales data, sales, estimating, specifications, engineering, requisition, purchase, inspection, expediting, production, costs, shop schedules, test, shipping, installation, maintenance, repairs, service, etc. Executive ability and engineering experience such as to make it applicable to practically any mechanical product. CE–380.

PLANT ENGINEER, Assoc. M. Am. Soc. C. E., and M. Inst. Mech. Engrs., London; age 47; over twenty-five years' works and office experience on designs, estimates, installation and maintenance of large steelworks and shipyard plants. Good technical education and fully qualified for responsible position. Already served as shop superintendent, chief designer, and chief engineer. CE–381.

ASSOC. M. AM. SOC. C. E.; age 37; married; high grade technical education combined with fourteen years' practical construction experience on buildings, large concrete dams, port works, and railroads. Capable of directing large construction project or managing office. Has had exceptionable experience in structural design of buildings, especially in problems involving statically indeterminate reinforced concrete structures and difficult foundations. Practical experience in the design of mechanical equipment of buildings: heating, ventilating, air-conditioning, refrigeration, and electric wiring. Extensive experience in design and installation of large construction plants involving placing of large volume of concrete, gravity chuting operations, gravel and rock-crushing plants, mechanical handling equipment, and steam shovel operations. Detailed data pertaining to engineering experience and excellent credentials furnished. Location immaterial; now located on Pacific Coast. CE–382.

CIVIL ENGINEER, M. Am. Soc. C. E., age 42; university education; twenty years' experience in railway, hydraulics, water supply, river and flood control, and other allied subjects is open for engagement, private, corporate, or otherwise. Now engaged in private practice. High professional reputation and business references. Correspondence or interview solicited. CE–383.

EXECUTIVE ENGINEER, Assoc. M. Am. Soc. C. E.; age 39; married. Twenty years' broad engineering and constructing experience on railroads, water supply, industrial plants, marine terminals, city planning and housing developments, highways, sewerage, and other public utilities, with holding companies, consulting engineers, and contractors. References and details of experience on request. CE–384.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; graduate. At present, Chief Engineer, large oil producing company in Spanish-American country. Five years' experience in petroleum production, seventeen years' experience in railway, municipal, and general construction. Working knowledge of Spanish. Highest references. Will be free for interview and engagement January 1st, 1923. CE–385.

CIVIL ENGINEER, M. Am. Soc. C. E.; age 37; married. Sixteen years' experience in design and supervision of construction of steam and electric railways, highways, street pavements, sewers, and water-works. Now on highway work. Available January 1st, 1923. CE–386.

ENGINEER, university education, with railway (steam and electric) and highway experience on location, construction, and maintenance in the United States, China, West Indies, and France, desires position in foreign country, services available at once. CE–387.

CIVIL ENGINEER, M. Am. Soc. C. E.; technical graduate; age 37; single. Sixteen years' field and office experience on railway maintenance of way and general construction engineering, latter included office supervision of design, purchase of materials and equipment, construction, and field supervision of construction of various railway and industrial plants. Officer of U. S. Engineer troops for 27 months during World War (in France most of time). Prefers engineering work of an executive nature, or leading to that. Available at once. CE–388.

ENGINEER AND EXECUTIVE, M. Am. Soc. C. E.; age 46; experience in United States, Alaska, Panama, and Peru, on municipal and public utility construction, harbor improvement, dredging, dams, irrigation, shipbuilding, investigations, and reports. Speaks Spanish. Services available first of the year. CE–389.

CONSTRUCTION ENGINEER, Assoc. M. Am. Soc. C. E.; age 37; married. Eighteen years' experience in general engineering and construction work, covering railroad maintenance and construction, harbor improvements, dock, power plant, and building construction. Now employed with large company. Desires change. Permanent position. Will consider industry or contractor. Vicinity of Great Lakes preferred. CE–390.

NEW BOOKS*

(From November 1st to November 30th, 1922)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

DONATIONS TO ENGINEERING SOCIETIES LIBRARY

EXERCISES IN THE ELEMENTS OF DESCRIPTIVE GEOMETRY.

By Richard Shelton Kirby. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 49 pp., illus., 7 x 10 in., cloth. $1.00.

This collection which includes nearly 900 problems, is intended to provide an abundance of drill exercises, supplemented by practical applications. Special features are the notation, the statement of most of the problems in words, the general use of the third quadrant, the emphasis on elementary problems and the practical applications. It is intended for use with Tracy and North's "Descriptive Geometry", but can also be used with other texts.

HÜTTE:

Hilfstafeln Zur I. Verwandlung von Echten Brüchen in Dezilmalbrüche II. Zerlegung der Zahlen bis 10 000 in Primfaktoren. Dritte Auflage. Herausgegeben vom Akademischen Verein Hütte. Berlin, Wilhelm Ernst & Sohn, 1922. 83 pp., tab., 8 x 5 in., paper. 2 marks.

Two convenient mathematical tables for the use of calculators and designers are given in this book. Table I is a series of common fractions arranged in an increasing series and accompanied by their decimal equivalents, calculated to eleven places. It can be used to translate any decimal fraction into a common fraction, neither term of which will be greater than 100. Table II gives the simplest factors of all numbers not divisible by 2 or 5, from 1 to 10 000 and also shows the prime numbers in this range. The tables are intended primarily for determining gear ratios for lathes, milling machines, etc., but are adapted for other uses as well. Examples of their use for various purposes are given.

MANUFACTURE AND USES OF ABRASIVE MATERIALS.

By Alfred B. Searle. (Pitman's Technical Primer Series.) Lond. and N. Y., Isaac Pitman & Sons, 1922. 118 pp., illus., 6 x 4 in., cloth. 85 cents.

This text contains a brief description of abrasive materials and their preparation and of the manufacture of abrasive wheels, papers, and polishes, together with advice on the selection and testing of abrasives, and the erection and operation of grinding machines. The book should be useful to those called on to deal with grinding problems without any very extended experience in the art.

PRODUCTION GRINDING.

By Fred B. Jacobs. Cleveland, Ohio, Penton Publishing Co., 1922. 238 pp., illus., 9 x 6 in., cloth. $3.00.

The methods used in representative plants for cutting and finishing machine parts is described herein. The subject-matter includes the practice of the Marmon, Packard, Oakland, Chevrolet, and Ford automobile plants, methods for finishing chilled-iron valve cams, ball and roller-bearing production, grinding operations in the making of dental tools, finishing calender rolls, reconditioning automobile engines, die-grinding, and the making of milling cutters. Full data are given concerning methods and output.

MECHANICAL LABORATORY METHODS.

By Julian C. Smallwood. Third Edition. N. Y., Van Nostrand Co., 1922. 423 pp., diagrams, 7 x 5 in., fabrikoid. $3.50.

In this handbook for students and mechanical engineers, the author, in Part 1, discusses the calibration and testing of balances, gauges, dynamometers, engine indicators, planimeters, meters for gases and water thermometers, calorimeters, etc. In Part 2, he gives methods for testing fuels. In Part 3, he treats of the testing of power-plant units, such as steam engines, pumps and boilers, condensers, gas producers, refrigeration plants, blowers and compressors, and water motors. The new edition has been thoroughly revised and modernized.

THEORY OF WAVE TRANSMISSION.

By George Constantinesco. Second Edition, Revised. Lond., Walter Haddon, 1922. 209 pp., tab., 9 x 5 in., cloth. 10s 6d.

* Unless otherwise specified, these books have been donated by the publishers.

This book contains a detailed mathematical exposition of the theory underlying the method of power transmission invented by the author. In this system, energy is transmitted from one point to another by means of periodic variations of pressure which produce longitudinal wave pulsations in a column of liquid enclosed in a system of piping connecting the wave generator and the tool or machine. Many advantages are claimed for the method, which has been applied practically to rock drills and other percussive tools and to trigger control in machine guns, and is now being adapted to the production of rotary motion.

BERECHNEN UND ENTWERFEN VON TURBINEN- UND WASSERKRAFT-ANLAGEN.

Von Holl. Dritte Auflage. München, R. Oldenbourg, 1922. 181 pp., illus., 10 x 7 in., paper. 225 marks.

This book was written with the intention of furnishing all who are interested in water-power plants with a convenient assistant in solving the various problems that arise in calculation and design. To facilitate calculation, the author invented a turbine slide rule, the use of which is explained. In this edition, which is thoroughly revised, it is planned to give the designer a concise introduction to all the structural and mechanical details of water-power plants. Which will not only enable him to determine the turbine system for any projected plant, but will also give information on the construction required in connection therewith.

BELT CONVEYORS AND BELT ELEVATORS.

By Frederic V. Hetzel. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 333 pp., illus., diagrams, tab., 9 x 6 in., cloth. $5.00.

This volume deals with belt conveyors and belt elevators, and utilizes these machines, which are so widely useful, to illustrate some of the general principles that underlie the design and use of conveying and elevating machinery. The author has had thirty years' experience in the design, manufacture, and erection of machinery of this kind.

A. S. T. M. TENTATIVE STANDARDS, 1922.

Phila., Am. Soc. for Testing Materials, 1922. 9 x 6 in., cloth. $8.00.

The 1922 issue of tentative standards contains 163 specifications for engineering materials, such as metals, cement, lime, gypsum, and clay products, preservative coatings, petroleum products, road materials, coal and coke, water-proofing, insulating materials, containers, rubber goods, and textiles. These specifications are tentative, that is, they are distributed prior to definite adoption, for the purpose of eliciting criticism.

BITUMINOUS COAL MINE ACCOUNTING.

By W. B. Reed. N. Y. and Lond., McGraw-Hill Book Co., 1922. 221 pp., 9 x 6 in., cloth. $3.00.

This treatise is based on a series of articles on "Cost Accounting in the Bituminous Industry" which appeared in the *Coal Review* and have now been expanded to include not only costs, but also some questions of general accounting. It discusses the proper methods of accounting for bituminous mines, particularly those of small size. Sample forms, selected from actual practice, are given throughout the book.

ANTHRACITE AND THE ANTHRACITE INDUSTRY.

By A. Leonard Summers. (Pitman's Common Commodities and Industries.) Lond. and N. Y., Isaac Pitman & Sons, [1922]. 126 pp., illus., map, 7 x 5 in., cloth. $1.00.

This is a brief non-technical account of anthracite mining, and of the advantages of anthracite as a fuel, with special reference to British conditions.

BUREAU OF MINES.

By Fred Wilbur Powell. (Institute for Government Research. Service Monographs of the U. S. Government No. 3.) N. Y. and Lond., D. Appleton & Co., 1922. 162 pp., 9 x 6 in., cloth. $1.00.

This monograph is a description of the United States Bureau of Mines, intended as a record of actual conditions and devoid of criticism or suggestions for improvement. It contains the history of the establishment and development of the Bureau, a detailed description of its specific activities, its organization for handling them, the character of its plant, a compilation of the laws and regulations governing its operations, financial statements showing its appropriations, expenditures, and other data from 1911 to 1922, and a bibliography of the sources of information on its service and operations. This book is one of a series prepared by the Institute for Government Research to describe in detail each of the services of the Government.

SHIELD AND COMPRESSED AIR TUNNELING.

By B. H. M. Hewett and S. Johannesson. N. Y. and Lond., McGraw-Hill Book Co., 1922. 465 pp., illus., diagrams, tab., 9 x 6 in., cloth. $5.00.

The authors state that so much tunneling has been done with the aid of the shield and the art of such work has been developed to such a point that it is now possible to formulate, to some extent at least, certain principles and rules of practice on which to base the design and construction methods of future work. This they have tried to do in the present book,

which treats of tunnel design, stresses in tunnel linings, methods of lining, tunnel shields, plant and equipment, methods of construction, maintenance and inspection, progress, cost, and surveying. A chapter is devoted to compressed-air sickness. A good bibliography is included.

PRACTICAL TREATISE ON SUSPENSION BRIDGES.

By D. B. Steinman. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 204 pp., illus., diagrams, charts, 9 x 6 in., cloth. $4.00.

This book has been planned for practicing engineers engaged in estimating, designing, or building suspension bridges, and for students. It is intended as an up to date, practical handbook, distinguished by simplicity and convenience. Division 1, on Stresses, presents formulas derived from modern practice, reduced to their simplest and most convenient form for direct application. Division 2, on Types and Details of Construction, is intended to assist in the selection of the best type and the determination of proportions for the various elements. The third division, on Typical Design Computations, gives numerical examples of the application of the author's methods to designs of different types. The final division, on Erection, describes and illustrates the successive stages. An Appendix contains charts designed for the expeditious proportioning of suspension bridges.

RAILROAD CONSTRUCTION.

By Walter Loring Webb. Seventh Edition, Revised and Enlarged. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 847 pp., illus., diagrams, tab., 7 x 4 in., fabrikoid. $5.00.

Important changes and additions have been made in this edition of this book in relation to the shrinkage of embankments; the laws governing the life of ties; substitutes for wooden ties; rail specifications, testing, failures, wear; rail-joint failures; water-tank construction; hump-yards; yard grades; train resistance; and stresses in track.

MOTOR VEHICLE ENGINEERING; THE CHASSIS.

By Ethelbert Favary. N. Y. and Lond., McGraw-Hill Book Co., 1922. 468 pp., illus., diagrams, 9 x 6 in., cloth. $5.00.

In this volume, as in the preceding volume on engines, the author endeavors to present, in simple language and with only elementary mathematics, the information required by the automotive engineer and the designer. It is not intended as a history of automobile development, nor as a mere description of present practice as exemplified in the vehicles now being manufactured, but to explain the theory that underlies the design of the automobile chassis.

SANITATION OF BATH HOUSES.

By William Paul Gerhard. N. Y., W. I. Comstock, 1922. 16 pp., illus., 10 x 8 in., paper. 60 cents.

This book is reprinted from an article previously published in *Architecture and Building*, and discusses briefly the various types of public baths, the water supply for swimming pools, and its purification, and some of the engineering details of bathhouses.

HANDBOOK OF THE NATIONAL DISTRICT HEATING ASSOCIATION.

Greenville, Ohio, D. L. Gaskill, Secretary-Treasurer, 1921. 7 x 5 in., fabrikoid. $5.00.

This handbook has been been prepared by the Educational Committee of the Association, and is intended as a working manual of district heating practice, particularly with respect to engineering problems. The material is published in loose-leaf form, arranged in two general divisions, Steam and Hot Water Heating. Each of these divisions is subdivided into the following groups: General, Generation, Distribution, Utilization, and Metering. In addition to engineering data, commercial information supplied by manufacturers of apparatus, is included.

STEAM TURBINE; THEORY AND PRACTICE.

By William J. Kearton. Lond. and N. Y., Isaac Pitman, 1922. 456 pp., illus., diagrams, 9 x 6 in., cloth. $4.50.

In the opinion of the author, many recent books on the steam turbine have been overdeveloped along certain lines, and few have been generally useful to the student. The present work is written for the student, and should prove useful to engineers and draftsmen desiring a wider knowledge of theory. After introductory chapters on the properties of steam and entropy, the book treats of the steam turbine cycle, the flow of steam through nozzles and blades, efficiency, lubrication, stresses, critical speed and turbine design. This is followed by descriptions of commercial turbines of various types.

DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA.

By A. L. Dyke. Thirteenth Edition. Chic., Goodheart-Willcox Co., 1922. 1 226 pp., illus., 10 x 7 in., cloth. $6.00.

The new edition of this well known reference and instruction book has been entirely rewritten and re-arranged. The number of pages has been increased from 960 to 1 238, and the illustrations from 3 362 to 4 143. As it is intended for owners, repair men, and students, the book is a remarkably comprehensive compendum of information on automobile construction, operation, and repair.

HANDBOOK FOR ELECTRICAL ENGINEERS.

By Harold Pender and W. A. Del Mar. Second Edition. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 2 263 pp., diagrams, tab., 7 x 5 in., fabrikoid. $6.00.

The author's aim was to prepare a handbook for the practicing engineer. With this end in view, theoretical matters have been segregated into separate articles, and articles dealing with practical matters are confined to the latter. These articles are arranged alphabetically, but a topical list of them is provided as a guide for consecutive study. Bibliographies are included and cost data are given. The second edition is about one-tenth larger than the first. A number of entirely new articles have been added, many others have been entirely rewritten, and the remaining subject-matter has been thoroughly revised. The editor has been assisted by more than forty specialists.

ELECTRIC POWER PLANT ENGINEERING.

By J. Weingreen. Third Edition. N. Y. and Lond., McGraw-Hill Book Co., 1922. 511 pp., illus., diagrams, 9 x 6 in., cloth.

This text is intended to provide information on practical problems connected with the control of the generation and distribution of electrical energy. Theoretical discussions are reduced to a minimum, the book being primarily a record of current American practice in power plant engineering. This edition has been thoroughly revised. New material has been added on oil switches, open-air switches, lightning arresters, and outdoor sub-stations, and reactive coils and synchronous condensers have been discussed in greater detail.

SPARKING PLUGS.

By A. P. Young and H. Warren. (Pitman's Technical Primer Series.) Lond. and N. Y., Isaac Pitman & Sons, 1922. 106 pp., illus., diagrams, tab., 6 x 4 in., cloth. 85 cents.

This little book reviews briefly the history of spark plugs and discusses the general principles of electric ignition. The operation and design of spark plugs is then considered in detail. The questions of electrodes and voltages are also treated in detail, with data from researches by the authors. This is followed by a consideration of the composition and properties of spark plug insulators.

DIRECT-CURRENT MACHINERY.

By Harold Pender. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 314 pp., illus., diagrams, 9 x 6 in., cloth. $3.00.

The author states that he knows of no textbook on direct-current machinery which gives a thorough treatment of the theory and performance of such machines, without, at the same time, going into the details of design to such an extent as to be confusing to the ordinary undergraduate student. It is with the desire to provide such a text that this book is offered. It presents the theory of direct-current machines and gives much space to the performance, application, and testing of the various types of direct-current generators and motors. The testing methods given are those commonly used in commercial laboratories and by manufacturing companies.

ELECTRIC TRANSIENTS.

By Carl Edward Magnusson, A. Kalin, and J. R. Tolmie. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1922. 193 pp., diagrams, 9 x 6 in., cloth. $2.50.

The purpose of this book which is an outline of an introductory lecture and laboratory course given at the University of Washington, is to aid the student in gaining clear concepts of the fundamental principles of transient electric phenomena and their application to quantitative problems. Emphasis is placed on the physical properties of electric transients.

INORGANIC CHEMISTRY.

By H. G. Denham. Lond., Edward Arnold & Co., 1922. 684 pp., illus., diagrams, tab., 8 x 5 in., cloth. $4.00. (Gift of Longmans, Green & Co., N. Y.)

Believing that much of the difficulty experienced by those beginning the study of inorganic chemistry is due to their inability to correlate and classify their observations, the author of this work has endeavored to systematize the subject by giving more than usual prominence to the periodic system. The book is intended for university students and covers the ground usually included in general courses.

AMERICAN MALLEABLE CAST IRON.

By H. A. Schwartz. Cleveland, Ohio, Penton Publishing Co., 1922. 416 pp., illus., diagrams, 9 x 6 in., cloth. $7.00.

This book, the only American one on the subject now in print, is the work of a metallurgist with long experience in the industry. The volume opens with a historical account of the development of the malleable industry in the United States from its inception in 1820. The various phases of manufacture are then discussed, including the plant, materials, fuels, refractories, and melting practice with air, electric, cupola, and open-hearth furnaces. Suc-

ceeding chapters treat of annealing, moulding, and pattern-making, cleaning, finishing, inspecting, and testing. The final section of the book is a study of the physical, thermal, and electrical properties of malleable castings, in which is given much hitherto unpublished material. A selected bibliography of nearly 200 references is given.

ELEKTRISCHE ÖFEN.

By Oswald Meyer. Berlin and Leipzig, Vereinigung Wissenschaftlicher Verleger, 1922. 133 pp., illus., 6 x 4 in., boards. 30 cents.

This little book opens with a short historical review of electric heating processes. Next are discussed the physical foundations, methods of measuring furnace temperatures, structural elements, and materials for electric furnaces. This is followed by a chapter devoted to the various types of furnaces, classified by methods of heating. The remaining chapters discuss the use of electric furnaces in various industries, domestic electric apparatus for heating and cooking, electric boilers, etc.

TELEPHONY.

By Samuel G. McMeen and Kempster B. Miller. Chic., Am. Technical Soc., 1922. 943 pp., illus., diagrams, 9 x 6 in., fabrikoid. $5.50.

This is a descriptive, non-mathematical work covering the entire field of telephone engineering in one volume of reasonable size. The authors describe the customary types of subscribers apparatus, line systems, switchboards, automatic systems, line construction, central offices, etc. The text is based on American practice.

STORES AND MATERIALS CONTROL.

By Madison Cartmell. N. Y., Ronald Press Co., 1922. 459 pp., charts, 9 x 6 in., cloth. $4.50.

This book presents the general subject of procuring and handling materials, covering storeskeeping, manufacturing, and purchasing from the point of view of the executive in charge of production. It tries to explain in detail the procedure to be adopted for an effective system of materials control in both large and small organizations.

ALASKAN ENGINEERING COMMISSION.

By Joshua Bernhardt. (Institute for Government Research. Service Monographs of the United States Government, No. 4.) N. Y. and Lond., D. Appleton & Co., 1922. 124 pp., 9 x 6 in., cloth. $1.00.

This monograph, prepared for the Institute for Government Research, follows the general plan adopted for the series. It covers the work of the Alaskan Engineering Commission from its creation in 1914 to 1921, in constructing the U. S. Government Railroad and in the various other activities that devolved on it. The account is historical, descriptive, and financial. It gives a concise summary of information suited to the needs of Government officials, members of Congress and the public.

WEATHER BUREAU.

By Gustavus A. Weber. N. Y. and Lond., D. Appleton & Co., 1922. (Institute for Government Research. Service Monographs of the U. S. Government, No. 9) 87 pp., 9 x 6 in., cloth. $1.00.

This monograph contains a detailed account of the Weather Bureau, covering its history, activities, organization, and the character of its plant. A compilation of the laws and regulations that govern it is included, as well as financial statements showing its expenditures, and a bibliography of sources of information bearing on the Bureau.

U. S. GEOLOGICAL SURVEY; U. S. RECLAMATION SERVICE; NATIONAL PARK SERVICE.

(Institute for Government Research. Service Monographs of the U. S. Government, Nos. 1, 2, and 11.) N. Y. and Lond., D. Appleton & Co., 1918-22. 9 x 6 in., cloth. $1.00 each.

These monographs form part of a series intended to present in detail a description of each of the fifty or more distinct services of the Government. They are prepared according to a uniform plan, and give: First, the history of the establishment and the development of the service; second, its functions, described by detailing its specific activities; third, its organization; fourth, the character of its plant; fifth, the laws and regulations governing it; sixth, financial statements; and, finally, a full bibliography. The monographs are intended for those concerned with, or interested in, the administration of public affairs.

GEOLOGY OF THE COROCORO COPPER DISTRICT OF BOLIVIA.

By Joseph T. Singewald, Jr., and Edward W. Berry, (Studies in Geology, No. 1.) Balt., Johns Hopkins Press, 1922. 117 pp., illus., map, 10 x 6 in., paper. $1.25.

GEOLOGY AND PALEONTOLOGY OF THE HUANCAVELICA MERCURY DISTRICT.

By Edward W. Berry and Joseph T. Singewald, Jr. (Studies in Geology, No. 2.) Balt., Johns Hopkins Press, 1922. 100 pp., pl., map, 10 x 6 in., paper. $1.25. (Gift of Joseph T. Singewald, Jr.)

The first monograph is devoted to the Corocoro Copper District of Bolivia, the only commercially important copper district, except that of Lake Superior, where the principal form of occurrence is a native copper. The authors review the geology of the beds, describe the ore deposits, their genesis, the mining and ore treatment, and give a systematic account of the fossil plants. The first geologic map of the district is presented. The second monograph treats of the important Huancavelica Mercury District of Peru. After introductory chapters on mercury in Peru and the Chonta deposit in Huánuco, the location, history, and geology of the Huancavelica District is described. A systematic list of the Cretaceous fauna of the district is given. Both monographs contain bibliographies.

BUSINESS OF OIL PRODUCTION.

By Roswell H. Johnson, L. G. Huntley and R. E. Somers. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 264 pp., map, 9 x 6 in., cloth. $3.50.

This volume, intended for executives of oil companies, is an expansion of that part of Johnson and Huntley's "Principles of Oil and Gas Production" which treats of oil and gas production as a business. It discusses such subjects as the choice of regions, leasing methods of development, size and financing of companies, organization of staff, costs, accounting, depreciation, taxation, drilling methods, prices, and industrial outlook.

HANDBOOK OF CHEMICAL ENGINEERING.

By Donald M. Liddell. N. Y. and Lond., McGraw-Hill Book Co., 1922. 2 vol., illus., diagrams, tab., 9 x 6 in., fabrikoid. $8.00.

This book is intended as a reference work for experienced chemical engineers, and has been prepared by a group of specialists. It is concerned primarily with the major processes common to the chemical industries, and the plant and machinery required therefrom. Typical cases showing the application of these methods are given frequently, but the book does not attempt to supply information on the minor processes of individual industries.

THEORIES OF ORGANIC CHEMISTRY.

By Ferdinand Henrich. Translated and Enlarged from the Fourth German Edition of 1921, by T. B. Johnson and Dorothy Hahn. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 603 pp., 9 x 6 in., cloth. $6.00.

This text is a discussion of the present theories of organic chemistry, and is intended for graduate students and research chemists. The major lines of development are recorded from the original conceptions of Lavoisier, the reasons underlying the changing views are explained and references to the original literature are given. In preparing this translation, the translators have thought it desirable to stress the contributions of American investigators, and, therefore, have added much material on their work.

MANUFACTURE OF DYES.

By John Cannell Cain. Lond., MacMillan & Co., 1922. 274 pp., 9 x 6 in., cloth. $4.50.

This volume seems to be intended as a supplement to the author's earlier work. "The Manufacture of Intermediate Products for Dyes". It describes methods for making a large number of commercial dyes, giving details of the processes and referring to the English, American, French, and German patents concerned, as well as to descriptions in books and periodicals.

RESEARCHES ON CELLULOSE, VOL. 4, 1910-21.

By Charles F. Cross and Charles Dorée. Lond. and N. Y., Longmans, Green & Co., 1922. 253 pp., diagrams, tab., 8 x 5 in., cloth. $5.00.

These volumes of "Researches", of which this is the fourth, are intended as supplements to the original volume on "Cellulose", published in 1895. They provide a review and critical evaluation of the research work on the constitution and properties of cellulose which has been published in various technical journals, together with certain new matter contributed by the reviewers.

REIGN OF RUBBER.

By William C. Geer. N. Y. Century Co., 1922. 344 pp., illus., map, 8 x 5 in., cloth. $3.00.

This book contains an interesting account of the rubber industry, written in popular style and fully illustrated. The author describes the development of the industry from its beginnings and explains how certain representative rubber products, such as tires, footwear, and clothing, golf balls, electric conductors, hose, belting, packing, and balloon fabrics, are made. The book is intended for users of rubber goods, rather than for makers.

DONATIONS TO READING ROOM

SEAGOING AND OTHER CONCRETE SHIPS.

By N. K. Fougner, M. Am. Soc. C. E. (Oxford Technical Publications.) Lond., Henry Frowde and Hodder & Stoughton, 1922. 216 pp., illus., diagrams, 10 x 6 in., cloth. 22 shillings. (Gift of the Author.)

The aim of the author in writing this book has been to present a true record of the principal seagoing concrete ships actually built up to the present time, and to analyze the merits of these ships in comparison with those built of steel and wood. The calculations are condensed in the Appendix and have been avoided in the general text, in order to facilitate the reading for those not concerned with the technical side of the question.

CURRENT CIVIL ENGINEERING LITERATURE

KEY TO ABBREVIATED REFERENCES TO PUBLICATIONS INDEXED*

Abbreviated References.	Publication.	Place.
Am. C. Inst.	*American Concrete Institute, Proceedings* (Y.)	Detroit
A. I. E. E.	*American Institute of Electrical Engineers, Journal* (M.)	New York
A. R. E. A.	*American Railway Engineering Association, Proceedings* (Y.)	Chicago
A. S. T. M.	*American Society for Testing Materials, Proceedings* (Y.)	Philadelphia
Am. Soc. C. E.	*American Society of Civil Engineers, Proceedings* (M.)	New York
Am. Soc. Mun. Impvts.	*American Society for Municipal Improvements, Proceedings* (Y.)	New York
Am. W. W. Assoc.	*American Waterworks Association, Journal* (Bi-M.)	Baltimore
Am. Wood Prs. Assoc.	*American Wood Preservers Association, Proceedings* (Y.)	Baltimore
Ann. P. et C.	*Annales des Ponts et Chaussées* (Bi-M.)	Paris
Ann. T. P. Belg.	*Annales des Travaux Publics de Belgique* (Bi-M.)	Brussels
Assoc. Ing. Gand.	*Annales de l'Association des Ingénieurs sortis des Ecoles Spéciales de Gand* (Q.)	Ghent
Bost. Soc. C. E.	*Boston Society of Civil Engineers, Journal* (M.)	Boston
Can. Engr.	*Canadian Engineer* (W.)	Toronto
Cem. Eng.	*Cement and Engineering News* (M.)	Chicago
Cornell C. E.	*Cornell Civil Engineer* (M.)	Ithaca
Dock & Harbour	*Dock and Harbour Authority* (M.)	London
Eisenbau	*Der Eisenbau* (M.)	Leipzig
Eng.	*Engineering* (W.)	London
Eng. & Contr.	*Engineering and Contracting* (W.)	Chicago
Eng. Inst. Can.	*Engineering Institute of Canada, Journal* (M.)	Montreal
Eng. N. R.	*Engineering News-Record* (W.)	New York
Engrs. Club, St. L.	*Engineers Club, St. Louis, Journal* (Bi-M.)	St. Louis
Engrs. Soc. Pa.	*Engineers' Society of Pennsylvnia, Journal* (M.)	Harrisburg
Engrs. Soc. W. Pa.	*Engineers' Society of Western Pennsylvania, Journal* (M.)	Pittsburgh
Engr.	*Engineer* (W.)	London
Engrs. & Eng.	*Engineers and Engineering, Engineers' Club of Philadelphia* (M.)	Philadelphia
Gen. Civ.	*Le Génie Civil* (W.)	Paris
Gesund. Ing.	*Gesundheits Ingenieur* (W.)	Munich
Inst. C. E.	*Institution of Civil Engineers Minutes of Proceedings* (Q.)	London
Inst. Mun. & Co. Engrs.	*Institution of Municipal and County Engineers, Journal* (W)	London
Int. Ry. Assoc.	*International Railway Association, Bulletin* (M.)	Brussels
Land. Arch.	*Landscape Architecture* (M.)	Harrisburg
Mech. Eng.	*Mechanical Engineering* (M.) *Journal of the American Society of Mechanical Engineers*	New York
Mil. Engr.	*Military Engineer* (M.)	Washington
Min. & Metal.	*Mining and Metallurgy* (M.) *American Institute of Mining Engineers*	New York
Mun. & Co. Eng.	*Municipal and County Engineering* (M.)	Indianapolis
N. E. W. W. Assoc.	*New England Water Works Association, Journal* (M.)	Boston
N. Y. R. R Club.	*New York Railroad Club, Proceedings* (M.)	Brooklyn
Oest. Ing. Arch. Ver.	*Oesterreichischer Ingenieur und Architekten Verein, Zeitschrift* (W.)	Vienna
Power	*Power* (W.)	New York
Rev. Gen.	*Revue Générale des Chemins de Fer* (M.)	Paris
Ry. Age	*Railway Age* (W.)	New York
Ry. Main. Engr.	*Railway Maintenance Engineer* (M.)	Chicago
Ry. Rev.	*Railway Review* (W.)	Chicago
Schw. Bauz.	*Schweizerische Bauzeitung* (W.)	Zurich
Sci. Am.	*Scientific American* (M.)	New York
Soc. Ing. Civ. Fr.	*Société des Ingénieurs Civils de France, Mémoires et Comptes Rendus* (Q.)	Paris
Ver. deu. Ing.	*Verein deutscher Ingenieure, Zeitschrift* (W.)	Berlin
West. Ry. Club.	*Western Railway Club, Proceedings* (M.)	Chicago
West. Soc. Engrs.	*Western Society of Engineers, Journal* (M.)	Chicago
Zeit. Bau.	*Zeitschrift fur Bauwesen* (Q.)	Berlin
Z. d. Bauver.	*Zentralblatt der Bauverwaltung* (Semi-Weekly)	Berlin

* Y = Yearly; Q = Quarterly; M = Monthly; F = Fortnightly; W = Weekly.

A. Applied Sciences

a. Processes of Calculation

1. Mechanical Processes

Détermination Mécanique du Centre d'Ordonnée Moyenne d'une Courbe.* (Mechanical Determination of the Center of the Mean Ordinate of a Curve.) M. R. Vallette. Ann. P. et C. July–Aug., '22.

2. Graphical and Nomographical Processes

Chart Solution of Hydraulic Formulas.* J. B. Cutler. Power Nov. 14, '22.

B. Applied Mechanics

a. Mechanics of Solids (Strength of Materials)

1. Processes of Measurement and Methods of Testing

Floor Slab, Beam and Column Testing Machine at the National Physical Laboratory.* Eng. Oct. 20, '22.

2. Elastic Solids

Lateral Strength of Columns Subject to Flexure.* C. R. Young. Eng. N. R. Nov. 9, '22.

Ueber Drehung und Biegung von [-Eisen.* (On the Twisting and Bending of [-Iron.) Ad. Eggenschwyler. Schw. Bauz. Oct. 28, '22.

3. Jointed Systems

Die Angenäherten Einflusslinien für den Bogenträger ohne Gelenke.* (Approximate Influence Lines for Arched Girders Without Hinges.) G. Kriwoschein. Eisenbau Sept., '22.

Zur Berechnung zweistieliger Rahmentragwerke über drei Oeffnungen.* (On the Calculation of Frame Work Structures on Two Supports, Having Three Spans.) H. Muller-Breslau. Z. d. Bauver. Oct. 14, '22.

4. Riveted Systems

Rules for Rivet-Hole Deductions in Tension Members.* Victor H. Cochrane. Eng. N. R. Nov. 16, '22.

Die Angenäherten Einflusslinien für den Bogenträger ohne Gelenke.* (Approximate Influence Lines for Arched Girders Without Hinges.) G. Kriwoschein. Eisenbau Sept., '22.

Zur Berechnung zweistieliger Rahmentragwerke über drei Oeffnungen.* (On the Calculation of Frame Work Structures on Two Supports, Having Three Spans.) H. Muller-Breslau. Z. d. Bauver. Oct. 14, '22.

b. Hydraulics

2. Physical Hydraulics

Flow of Fluids Through Commercial Pipe Lines.* Robert E. Wilson and W. H. McAdams. Eng. N. R. Oct. 26, '22.

Note sur l'Ecoulement des Eaux a Travers les Massifs Filtrants.* (Note on the Flow of Water Through Filtering Masses.) Ann. T. P. Belg. Oct., '22.

3. Industrial Hydraulics

Proposed 450 000-Hp. Development at Niagara Falls.* Power Oct. 24, '22.

Wave Transmission of Power.* Engr. Serial beginning Oct. 27, '22.

The Improvement of the St. Lawrence from the Viewpoint of Private Capital.* Hugh L. Cooper. A. I. E. E. Nov., '22.

The Water Power Problem; A Symposium: The Colorado River Development. Arthur P. Davis. Present Tendencies of Water-Power Development in New York State.* John P. Hogan. The Operation of the Federal Water Power Act. O. C. Merrill. High Voltage Power Transmission.* F. W. Peek, Jr. Social and Economic Aspects of Hydro-Electric Power. Charles D. Marx. Am. Soc. C. E. Nov., '22.

Hydro-Electric Development on the Abitibi River.* James Dick. Can. Engr. Nov. 7, '22.

Complications of Transportation on Western Power Job.* Eng. N. R. Nov. 16, '22.

A Low-Head Hydro-Electric Plant of 84 000 Hp. in Norway.* W. Francis Lloyd. Eng. N. R. Nov. 23, '22.

c. Pneumatics

2. Physical Pneumatics

A Study of High Winds and Thunderstorm Effects.* Jacques W. Redway. Eng. N. R. Nov. 23, '22.

3. Industrial Pneumatics

Some Modern Applications of Compressed Air.* F. A. McLean. Can. Engr. Nov. 7, '22.

C. Materials of Construction and General Processes

a. Lime, Cement, Mortar, Concrete, Brick, Bitumen, etc.

Concreting Operations in Cold Weather.* (From Pamph. Issued by Portland Cement Assoc.) Eng. & Contr. Oct. 25, '22.

Tests of Concrete in Sea Water. Discussion: A. H. Rhett and L. F. Bellinger. Am. Soc. C. E. Nov., '22.

Tentative Specifications for Concrete and Reinforced Concrete.* Jacob Feld and C. S. Whitney. Am. Soc. C. E. Nov., '22.

Durability of Concrete in Alkali Soils. G. M. Williams. Can. Engr. Nov. 14, '22.

Essais Prolongés de Résistance et de Décomposition des Principaux Types de Liants Hydrauliques.* (Prolonged Tests of the Strength and Decomposition of the Principal Types of Hydraulic Binders.) R. Feret. Ann. P. et C. July–Aug., '22.

Der gebrannte Hohlziegel. (Burnt Hollow Brick.) Oest. Ing. Arch. Ver. Sept. 8, '22.

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c. Preservation and Use of Materials. Painting, Waterproofing

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f. Rock Excavation. Mining. Rock Removal

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g. Execution of Works. Specifications

2. Of Concrete

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3. Of Wood

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5. Of Reinforced Concrete

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x. Miscellaneous

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h. Foundations

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j. Piles and Pile-Driving

Marine Destroyers of Harbor Works. Herman Von Schrenk. (From paper read before Am. Assoc. of Port Auth.) Eng. & Contr. Oct. 25, '22.
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k. Tunnels and Tunneling-Shields

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l. Construction Machinery and Tools. Drainage

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D. Highways

c. Construction

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h. Computations, Tests, etc.

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E. Bridges, Viaducts, and Arches

a. Timber Bridges and Viaducts

Fire Prevention in Timber Floors of Highway Bridges.* Eng. N. R. Nov. 9, '22.

b. Iron or Steel Bridges and Viaducts

Steel Highway Bridge Over the Bastiscan River.* F. B. Painchaud. Can. Engr. Nov. 14, '22.

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North Hill Viaduct, Akron, Ohio, Completed.* D. M. Taylor. Nov. 18, '22.

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f. Suspension Bridges. Transfer Bridges

Old Suspension Bridge Used in Erecting New Arch.* C. B. McCullough. Eng. N. R. Nov. 2, '22.

g. Swing, Bascule, Lift, Floating, Oscillating Bridges; Traveling Cranes

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h. Computations, Tests, etc.

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F. Inland Waters

a. Natural Waterways (General Articles)

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b. Canals (General Articles)

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c. Regulation of Waterways—Volume of Discharge, Freshets, Floods, Soundings

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j. River and Lake Ports, Equipment

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G. Maritime Works

c. Vessels and Maritime Navigation. Lighthouses and Buoys. Various Signals

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d. Roads and Outer Harbors. Dikes and Jetties. Breakwaters

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h. Wharves. Mooring Buoys. Harbor Equipment

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i. Harbors (General Articles)

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j. Dockyard Machinery and Shipyards. Dry Docks

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H. Railroads. Street and Interurban Railways. Automobiles. Aeronautics

a. Railroads

1. General Articles

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A New Project for a Railroad to Hudson Bay.* Ry. Age Nov. 18, '22.

4. Track

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5. Signals and Safety Apparatus

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6. Rolling Stock (Locomotives, Cars)

The Design of a Modern 40-Ton Capacity Composite Box Car.* Ry. Rev. Oct. 21, '22.
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7. Use of Electricity

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8. Stations. Engine Houses. Shops

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b. Special Railroads

3. Narrow Gauge. Light Railways

Logging Railway Practice in the Northwestern Forests.* Eng. N. R. Nov. 23, '22.

d. Street Railways. Elevated Railways. Subways

4. Track

Electric Railway Track Construction. J. W. McIlrath. (Paper read before City Paving Conference.) Can. Engr. Oct. 31, '22.
Steel Ties and Curbs.* Can. Engr. Nov. 21, '22.

5. Rolling Stock

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6. Traction

British View of Railless Electric Traction. E. M. Munro. (Abstract of paper read before Tramways and Light Railways Assoc.) Can. Engr. Oct. 31, '22.

e. Automobiles

2. Internal Combustion Engine Automobiles

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f. Aeronautics

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I. Municipal Water-Works. Agricultural Engineering

a. General Articles

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The New Water Supply of the City of Providence.* Frank E. Winsor. N. E. W. W. Assoc. Sept., '22.

b. Hydrology. Water Resources

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c. Dams and Reservoirs

The Deep Core-Wall of the Wanaque Dam.* Arthur H. Pratt. N. E. W. W. Assoc. Sept., '22.
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d. Analysis and Purification of Water

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e. Distribution of Water

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A New Method of Purifying Water. H. W. Clark. N. E. W. W. Assoc. Sept., '22.
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The Victaulic Pipe Joint.* Thorndike Saville. Am. W. W. Assoc. Nov., '22.
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J. Sewerage. Sewage and Refuse Disposal

a. Sewers and Drains

Construction and Maintenance of Sewers and Drains. (From Committee Report read before Am. Ry. Bridge and Building Assoc.) Ry. Main. Engr. Nov., '22.
Detroit's Intensive Sewer Construction Program.* J. R. Hendry. Eng. N. R. Nov. 2, '22.
Studies of Discharge of Sanitary Sewers at Phoenix.* S. M. Cotten. Eng. N. R. Nov. 16, '22.
Spokane Intercepting Sewer Design Construction and Assessment.* A. D. Butler. Eng. N. R. Nov. 23, '22.

b. Sewage Disposal. Purification

Present Status of the Activated Sludge Process of Sewage Treatment.* Langdon Pearse. Mun. & Co. Eng. Nov., '22.
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c. Refuse Disposal

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K. Heat Engines.

a. Steam Engines. Boilers

A. S. M. E. Boiler Code, Part 1—Section VI, Preliminary Report on Rules for the Construction of Unfired Pressure Vessels.* Mech. Eng. Nov., '22.

b. Steam Turbines

Der Dampfverbrauch von Dampfturbinen.* (Steam Consumption in Steam Turbines.) G. Forner. Ver. deu. Ing. Serial beginning Oct. 7, '22.

L. Electricity

a. Production of Electricity

2. Magneto and Dynamo. Electric Machines
Neuere Entwicklung im Bau von Turbo-Generatoren.* (Recent Developments in Turbo-Generator Construction.) H. Rikli. Schw. Bauz. Oct. 28, '22.

b. Distribution and Transmission of Electricity

1. Power Plants
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f. Signals and Communication

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M. Architecture

b. Business and Commercial Buildings

Der Wettbewerb für Entwürfe zu dem Kaufmannshaus in Köln.* (The Competition for Designs for the Merchants' Exchange Building in Cologne.) Hubert Ritter. Z. d. Bauver. Oct. 14, '22.

c. Residences, Hotels

Die übermassigen Kosten der Heizung, Speisenbereitung und Beleuchtung in ihrer Wirkung auf die Wohnungsnot. (The Excessive Cost of Heating, Preparing Food, and Lighting, in Their Effect on the Housing Shortage.) H. Chr. Nussbaum. Gesund. Ing. Oct. 7, '22.

f. Factories and Mill Buildings

Gewerbehygienische Anlagen zum Schutze gegen Staub, Rauch, Dämpfe, Hitze u. a. m.* (Hygienic Installations in Industrial Plants for Protection from Dust, Smoke, Fumes, Heat, etc.) L. Aretz. Gesund. Ing. Sept. 30, '22.
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g. Other Buildings

Design Features of the University of Kansas Stadium.* Clement C. Williams. Eng. N. R. Nov. 9, '22.
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h. Roofs and Domes

The Restoration and Preservation of Westminster Hall Roof.* Engr. Nov. 10, '22.

i. Fire Protection

Fire Tests Favorable to Cinder Concrete Block.* Eng. N. R. Oct. 26, '22.

x. Miscellaneous

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N. Landscape Engineering. City Planning

Zur Lagerung städtischer Wohnblockes zur Himmelsrichtung mit Rücksicht auf die Besonnungsverhältnisse. (On the Arrangement of Urban Residential Blocks Toward the Points of the Compass, with Respect to the Proportion of Sunshine.) H. Chr. Nussbaum. Gesund. Ing. Oct. 7, '22.
Vorschläge für Zonenbauordnungen in England und Amerika.* (Proposals for Building Zone Regulations in England and America.) J. Stübben. Z. d. Bauver. Oct. 11, '22.

O. Administration. Legislation. Economics. Statistics

a. General Legislation

La Politique des Chemins de Fer en Chine. Ce qu'elle est et ce qu'elle doit être. (Railway Politics in China. What It Is, and What It Should Be.) G. Grené. Gen. Civ. Oct. 21, '22.

b. Economic Questions of a General Character. Valuations

Principles and Practices for the Valuation of Public Utilities. R. A. C. Henry. Eng. Inst. Can. Nov., '22.
Original Investment as a Basis of Value in Rate Making. Edward Flad. Eng. N. R. Nov. 2, '22.

d. Administrative and Financial Management of Means of Communication

5. Railroads and Street Railroads

Le Projet de Réorganisation des Chemins de Fer Allemands. (The Plan for Reorganizing the German Railways.) Rev. Gen. Oct., '22.

e. Legislation—Questions Concerning Wages and Working Conditions

Accident Prevention in Industrial Plants.* W. G. H. Cam. Eng. Inst. Can. Nov., '22.
Report of Committee on Classification and Remuneration of Engineers.* Eng. Inst. Can. Nov., '22.